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UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent and Trademark Office

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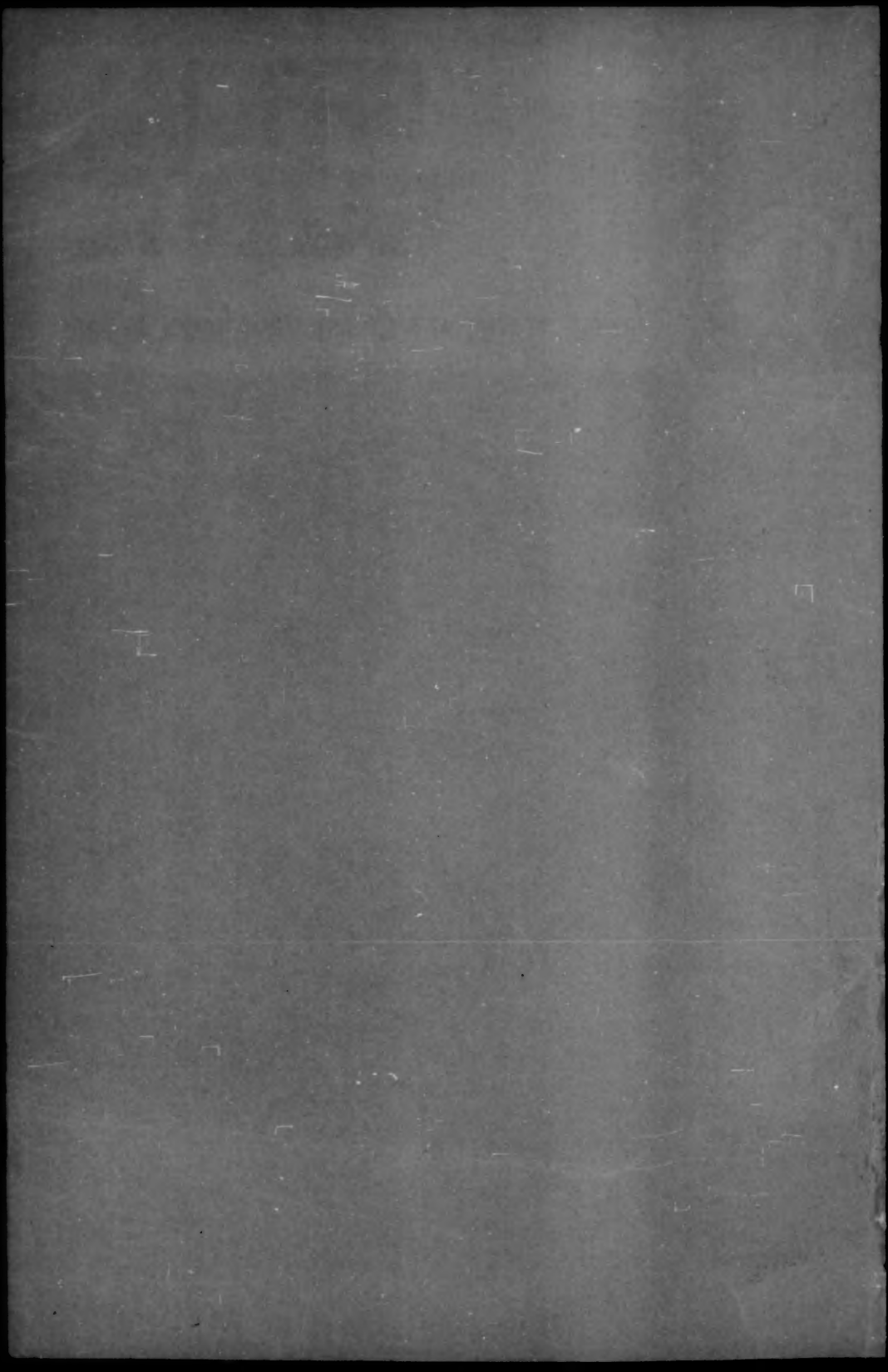

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Mar. 1984

Affirmed	222
Affirmed in Part	27
Reversed	85
Total	334

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,075,056, Re. S.N. 578,693, Filed Feb. 9, 1984, Cl. 162/305, PRESS SECTION STRUCTURE, Donald E. Ely, et al., Owner of Record: *Beloit Corp., Beloit, Wis.,* Attorney or Agent: James Van Santen, et al., Ex. Gp.: 173

4,100,010, Re. S.N. 582,317, Filed Feb. 22, 1984, Cl. 156/242, METHOD FOR MAKING DECORATIVE EMBLEMS, Robert E. Waugh, Owner of Record: *D. L. Auld Co., Columbus, Ohio,* Attorney or Agent: Edwin M. Baranowski, Ex. Gp.: 161

4,388,324, Re. S.N. 581,671, Filed Feb. 16, 1984, Cl. 424/312, PHARMACEUTICAL AND DIETARY COMPOSITION, David F. Horrobin, Owner of Record: *Efamol Ltd., London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 123

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 243,652, Reexam. No. 90/000,519, Requested: Mar. 2, 1984, Cl. 8/68, CORDLESS ELECTRIC TOOL, Donald W. Zurwelle, et al., Owner of Record: *Black & Decker Mfg. Co., Towson, Md.,* Attorney or Agent: Ronald B. Sherer, Ex. Gp.: 290, Requester: Owner

3,671,890, Reexam. No. 90/000,527, Requested: Mar. 19, 1984, Cl. 335/22, MANUALLY OPERABLE MOULDED CASE CIRCUIT BREAKER WITH SPECIAL TESTING MEANS, Keith W. Klein, et al., Owner of Record: *General Electric Co., Farmington, Conn.,* Attorney or Agent: Richard A. Menelly, Ex. Gp.: 210, Requester: Owner

3,947,241, Reexam. No. 90/000,533, Requested: Mar. 22, 1984, Cl. 432/121, FOOD TREATMENT APPARATUS AND PROCESS, Andrew A. Caridis, et al., Owner of Record: *Heat and Control, Inc., San Francisco, Calif.,* Attorney or Agent: Flehr, Hohbach, et al., Ex. Gp.: 340, Requester: Stein Assoc., Inc., Sandusky, Ohio

4,156,999, Reexam. No. 90/000,511, Requested: Feb. 27, 1984, Cl. 52/376, BEAM FOR CONCRETE FORMING STRUCTURES, Peter J. Avery, Owner of Record: *Aluma Systems, Inc., Downsview, Toronto, Ontario, Canada,* Attorney or Agent: None, Ex. Gp.: 350, Requester: Owner

4,166,465, Reexam. No. 90/000,531, Requested: Mar. 19, 1984, Cl. 128/303.15, ELECTROSURGICAL DISPERSIVE ELECTRODE, Janet M. Esty, et al., Owner of Record: *Nomed, Inc., Boulder, Colo.,* Attorney or Agent: John E. Reilly, Ex. Gp.: 330, Requester: Owner

4,395,832, Reexam. No. 90/000,535, Requested: Mar. 26, 1984, Cl. 34/92, GAS DUCT ARRANGEMENT FOR A VACUUM FURNACE, William R. Jones, et al., Owner of Record: *Vacuum Furnace Systems Corp., Souderton, Pa.,* Attorney or Agent: W. E. Cleaver, Ex. Gp.: 340, Requester: Abar Corp., Feasterville, Pa.

Patent Terms Extended Under 35 U.S.C. 155A

The patent term of each of the following patents has been extended under 35 U.S.C. 155A.

Patent No. 3,535,388, granted Oct. 20, 1970 to Ross C. Terrell, owner of record BOC, Inc. Term extended for a period of 1,923 days.

Patent No. 3,535,425, granted Oct. 20, 1970 to Ross C. Terrell, owner of record BOC, Inc. Term extended for a period of 1,923 days.

Patent and Trademark Office
Delegation of Authority

Agency: Patent and Trademark Office. Commerce.

The following memorandum is a delegation of authority from Assistant Secretary for Trade Administration to Assistant Secretary and Commissioner of Patents and Trademarks under the Export Administration Act of 1979, as amended, and other statutes.

Feb. 17, 1984.

Memorandum to Gerald J. Mossinghoff.
Assistant Secretary and Commissioner of Patents and Trademarks

From: William Archey, Acting Assistant Secretary for Trade Administration

Subject: Delegation of Authority under the Export Administration Act of 1979, as amended, and other statutes.

You have requested our clearance of a final rule, entitled "Revision of Foreign Filing License Procedure" (37 CFR Parts 1 and 5) scheduled to become effective June 1, 1984. This rule, among other things, revises procedures for obtaining licenses authorizing the foreign filing of patent applications for U.S. inventions as requires under the patent laws (35 U.S.C. 184). In addition, it revises procedures under which the Patent and Trademark Office (PTO) authorizes the export of technical data for purposes related to the filing of a foreign patent application. The export of such data is normally subject to licensing under the Export Administration Regulations (EAR) (15 CFR Part 379), issued under the Export Administration Act of 1979 as amended (50 U.S.C. app section 2401 et seq.), and the Nuclear Non-Proliferation Act of 1978 (22 U.S.C. 3201 et seq.). However, the EAR delegates licensing authority to the PTO in instances where the patent regulations (37 CFR Part 5) are complied with.

We have reviewed the final rule referred to above and have no objections to its issuance.

Additionally, in order to assure that PTO has adequate authority to administer the licensing procedures set out in 37 CFR Part 5, you are hereby delegated any necessary authority under the Export Administration Act of 1979, as amended, and the Nuclear Non-Proliferation Act of 1978. This authority is delegated to me by Part VI, section 1.01, paragraph (q) and (t), of ITA Organization and Function Order No. 41-1 of Feb. 15, 1982, as amended.

DONALD J. QUIGG,
Mar. 30, 1984. *Deputy Commissioner of Patents and Trademarks.*

[FR Doc. 84-8887 Filed 4-2-84: 8:45 am]
BILLING CODE 35 10- 16-M

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227-18]
Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce.

Action: Final rule.

Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing. The changes simplify the obtaining of licenses for filing foreign patent applications and for filing amendments, modifications, and supplements in foreign patent applications. Under the revised rules (1) the export, but not actual filing, of technical data to a foreign country for purposes related to the filing and prosecution of a patent application may be done either under appropriate export agencies' rules or by a license issued by the Commissioner of Patents and Trademarks, (2) certain licenses issued by the Commissioner for filing foreign patent applications include a license to file amendments, modifications, and supplements, containing additional matter in foreign applications, (3) specific contents of a petition for retroactive license are established and (4) fees are set for expedited handling of requests for foreign filing licenses and for certain petitions. These changes will result in reduced work for both patent applicants and the Patent and Trademark Office and at the same time strengthen national security protections.

Effective Date: June 1, 1984.

For Further Information Contact: Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed primarily to simplify and expedite the granting of licenses under 35 U.S.C. 184. It contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves. Notice of proposed rulemaking was published May 23, 1983, at 48 FR 23144 and corrected June 7, 1983, at 48 FR 26319.

Discussion of Specific Rules

Secton 5.11(a) has been substantially restructured and modified from the proposal. Under §5.11(a), a license from the Commissioner of Patents and Trademarks is always needed for the act of filing a patent application in a foreign patent office unless the six-month period has passed or the invention was not made in the United States.

Amended §5.11 (b) and (c) would clarify in the regulations that the export of technical data to a foreign country may be done under appropriate export agencies' rules controlling the export of technical data—Department of State (22 CFR Parts 121-130); Department of Commerce, International Trade Administration Office (15 CFR Part 379); or the Department of Energy (10 CFR Part 810)—or by license from the Commissioner. Compliance with the appropriate export agencies' rules or the license from the Commissioner is required before *exporting* technical data in the form of a patent application or data in any form if related to preparing, filing, and prosecuting a patent application in a foreign country, if the United States application has not been on file for six months at the time of export, or no application has been filed in the United States. It is optional from whom approval for export is obtained. In fact, for certain technical data being exported to certain countries, a specific request for a license or approval from any of the export agencies would not be necessary. However, a single license from the Commissioner would cover both export and filing and avoid any question whether a specific license or approval is required from any of the export agencies. Approval from the appropriate export agencies for export would require a separate additional license from the Commissioner for the filing of the foreign patent application. The rule changes will make the rules more closely conform with the regulations of other agencies which deal with the export of technical data to a foreign country.

The definition of export in these regulations will be controlled by the definition of export in the appropriate regulations of the export agencies having jurisdiction over the export of technical data related to the patent application. (15 CFR 379.1, 22 CFR 125.03 and 10 CFR 810.7).

The requirement of complying with the rules of the export agencies or the Commissioner before exporting an application to a foreign country is not intended to change long-standing Patent and Trademark Office interpretation of 35 U.S.C. 184 or in any way interpret the language in 35 U.S.C. 184 "file or cause or authorize to be filed" as requiring a license before technical data related to the filing or prosecution of an application is exported to a foreign country, such as to a foreign attorney or agent or corporation for review or revision for later filing. It does, however, reflect the delegations the

Commissioner has received from other agencies and which are referenced in §§5.18, 5.19 and new §5.20 and clarifies that a patent applicant must be licensed for export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application either by appropriate export agencies or by the Commission. The language "related to the preparation, filing or possible filing and prosecution of a foreign patent application" in §5.11(b) is used rather than "support a patent application" as used in §5.18 or "foreign filing" as used in §5.19 to make clearer that the latter two phrases include the export of technical data in the form of explanations or possible claim language or the like sent to a foreign agent or other person in relation to a foreign patent application. However, a license from the Commissioner would not substitute for approvals required by appropriate export agencies if technical data is exported for purposes not related to the filing or possible filing and prosecution of a foreign patent application. For example, a license from the Commissioner would not cover export of technical data in a U.S. patent application to a foreign research laboratory to support a research project.

Further, the rule is intended to reflect that every exportation of technical data related to filing or possible filing or prosecution within six months of a United States filing without a license from the Commissioner is prohibited unless the applicant complies with the rules of the appropriate export agencies. For example, where an application has been exported to a foreign agent with an authorization to file a foreign patent application, the export of the application may be under a general license from the International Trade Administration of the Department of Commerce. A license from the Commissioner is always necessary for the actual filing of the foreign patent application. In another example, where a validated license is needed under 15 CFR Part 379 to export technical data in the form of a patent application, applicants will need to obtain an International Trade Administration license or obtain a Commissioner's license prior to the act of export. Under either example, a license from the Commissioner is required before the application is filed in a foreign patent office. In the latter example, a single license from the Commissioner will permit both export and filing of the application.

This rule is promulgated under the authority of 35 U.S.C. 6 and delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978. Authority for this rule also exists under 35 U.S.C. 188.

The amended rule assures adequate protection of sensitive material under Title 35, United States Code and provides regulatory consistency with the Arms Export Control Act, as amended, the Export Administration Act, as amended, the Atomic Energy Act of 1954, as amended, the Nuclear Non-Proliferation Act of 1978, and their implementing regulations. The sanctions which apply for failure to obtain a license from either the Commissioner or the appropriate export agencies prior to export are the sanctions specified in the export acts. The sanctions which apply for failure to obtain a license from the Commissioner prior to the filing of a foreign application are the sanctions specified in Title 35, United States Code.

Section 5.11(d), proposed as §5.11(b), states that applications under secrecy order under §5.2 cannot be exported to an international agency or filed in a foreign country except in accordance with §5.5.

Section 5.11(e), proposed as §5.11(c), states that a license pursuant to paragraph (a) is not required where the invention was not made in the United States, or the United States application was on file for six months without a secrecy order being issued.

Section 5.11(f), proposed as §5.11(d), states that a license for foreign filing may be revoked at any time upon written notice. Similarly, an authorization for foreign filing resulting from the passage of six months from the filing of a United States patent application may be revoked by the imposition of a secrecy order. The revocation is effective as of the date of the notice and is not intended to be applicable to any prior acts by applicants relying in good faith on the grant of a license.

The language of §§5.12(b), 5.13, and 5.14 have been clarified from the proposal to reflect that the §1.17(h) requirement for a fee is for the expedited handling of a license. No fee is required for a routine, non-expedited request for a foreign filing license.

Section 5.15 has been changed from the form proposed. Amended §5.15 defines licenses for foreign export and filing of two different scopes. The §5.15(a) scope license, the grant of which is indicated on the filing receipt in accordance with §5.12(a) published at 48 FR 2696. (Jan. 20, 1983) and 1027 OG 9 (Feb. 1, 1983), permits the subsequent export and filing of technical data for purposes related to the preparation, filing or possible filing and prosecution of the foreign application and of any amendments or modifications to the application in a foreign country, even if "additional subject matter" were introduced; provided the additional subject matter does not change the general nature of the subject matter disclosed and does not pertain to certain categories of potentially sensitive material which are set forth in §5.15(a)(4).

The phrase "change the general nature of the subject matter disclosed" is intended to cover situations where the additional subject matter so alters the character of the disclosure that national security review is appropriate. This phrase is intended to permit a broad range of amendments, modifications and supplements, including additional subject matter. The following examples are intended to further clarify the meaning of the language "general nature of the subject matter disclosed" in §5.15(a):

Example 1—The physical data on a named compound. If a licensed disclosure gives the name and structure of a compound, the general nature of the subject matter disclosed includes physical data such as boiling point, melting point or specific gravity of the compound. If a name of a compound is disclosed, the structure of the compound is also within the general nature. If the licensed disclosure deals with the hardness of a claimed alloy, the disclosure of tensile strength is within the general nature.

Example 2—A known specie of a known genus. If the genus "lower alkyl" is disclosed, the inclusion of the species "methyl" is within the general nature, as would be homologs and isomers of that genus.

Example 3—Comparison data of the disclosed compound to data on prior art compounds. If the licensed disclosure contains a disclosure of the compounds of a pesticide invention, and pesticidal activities, the comparison of pesticidal data of a known compound representing the closest prior art is within the general nature.

Example 4—A specific optimum temperature within a specified temperature range. If a licensed disclosure has a range of 0°C to 120°C, the disclosure of an optimum temperature of 100°C is within the general nature.

Example 5—Activity data on compounds of the invention. If activity data on 30 of 50 named compounds is disclosed, the disclosure of activity data on other named compounds of the invention is within the general nature.

Example 6—Additional subject matter and utilities. If a licensed disclosure describes a chemical herbicide for weed control, the disclosure of chemical warfare uses or human toxic properties (other than to demonstrate safety or absence of such toxicity) *is not* within the general nature. If a licensed disclosure describes an analog computer for microwave telephone transmission, the addition of a cryptographic encoding or decoding device and utility *is not* within the general nature. If a licensed disclosure describes a battery power source for a satellite, the addition or substitution of a nuclear isotopic power source *is* within the general nature, but would be within the control of §5.15(a)(4)(ii).

A §5.15(b) scope license is limited to the original subject matter disclosed at the time the license was granted and does not cover "additional subject matter" as the phrase is currently interpreted (*In re Gaertner*, 202 USPQ 714 (CCPA 1979)).

Under §5.15(c), a license with the scope of §5.15(a) could also be granted pursuant to a §5.13 or §5.14 petition. If granted, the §5.15(a) scope of license will be indicated on the license grant. For instance, under §5.15(c) an applicant who filed a United States patent application before Feb. 27, 1983, when the filing receipt license practice became effective could request a §5.15(a) scope license which, if granted, will cover the subsequent filing of amendments, modifications or supplements, including additional matter in a corresponding foreign patent application. The licenses under §§5.12(b), 5.13, and 5.14 are normally limited in scope to the original subject matter disclosed at the time the license was granted unless a license of the §5.15(a) scope is indicated on the license grant. If a petition for a license under §5.12(b) is granted prior to the grant of the §5.12(a) filing receipt license, the former would merge into the latter and would be considered a §5.12(a) license for the purpose of §5.15.

A new §5.20, not included in the proposal, sets forth the specific authority of the Commissioner to license foreign filing, possible filing or prosecution of a patent application in a foreign country under 35 U.S.C. 184 regarding unclassified activities in foreign atomic energy programs. This change only reflects the existing relationship between 37 CFR 5.11 and 10 CFR §810.7 and alerts patent applicants in this technology to the Commissioner's authority. The term "sensitive nuclear technology" used in paragraph (b) of §5.20 is defined in 10 CFR §810.3(q).

A new §5.25, proposed initially as §5.20 and modified, sets forth in the regulations the requirements to be met for the granting of a retroactive license. The requirements include (1) a list of the foreign countries in which the patent application material was filed; (2) the date(s) of filing of the foreign application(s); (3) an oath or declaration which (i) states that the subject matter filed is not subject to a secrecy order under 35 U.S.C. 181, (ii) makes a showing of diligence in attempting to obtain the license upon discovery of the error, and (iii) makes a showing of facts which support a conclusion of inadvertence; and (4) includes the required fee. The section also provides in paragraph (b) for review from a denial of a petition for a retroactive license. The section further provides in paragraph (c) that the granting of a retroactive license pursuant to §5.25 does not excuse any violation of regulations of the export agencies which may have occurred because of the failure to obtain an appropriate license prior to export.

Sections 5.21, 5.22 and 5.23 have been redesignated to become §§5.31, 5.32 and 5.33, respectively.

Significant Differences Between Proposed and Final Rules

Section 1.17

Section 1.17(h) is amended to include a specific reference to §5.25 petitions for retroactive licenses for which the petition fee is charged, rather than having the present retroactive license fee under §1.182 petitions. The fee for §5.12(b) licenses is new and applies only where expedited handling of these license requests is sought. This fee for expedited handling is also referred to in §§5.13 and 5.14. Section 5.15(c) provides for a fee for changing the scope of a license.

Section 5.1

The proposed amendment to §5.1 is not being adopted and is withdrawn.

Section 5.11

Section 5.11 is amended to control the *export* of technical data in the form of an application or data in any form if related to preparing, filing, or prosecuting a patent application in a foreign country, if the United States application has not been on file for at least six months prior to the date of transmittal, or if no application has been filed in the United States. Export approvals, if required, may be provided by appropriate export agencies—Department of State; Department of Commerce, International Trade Administration or Department of Energy—or by the Commissioner. This will enable the Patent and Trademark Office and the export agencies to better reflect and exercise the export control functions set forth in the Arms Export Control Act, as amended, the Export Administration Act of 1979, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, respectively.

Under these Acts, the export of technical data is the activity to be controlled. The final rule differs from the proposed rule in that the Patent and Trademark Office will not be the sole export control authority over technical data in the form of an application, or data in any form, if related to preparing, filing, or prosecuting a patent application. Applications will have the option to obtain necessary export approvals either (1) from appropriate export agencies or (2) from the Commissioner. The Commissioner will continue to be the sole licensing authority for the act of filing an application in a foreign patent office.

Paragraphs (a), (b), and (c) of §5.11 control export activity by requiring either an export agency approval or a Commissioner's license for export of technical data in connection with foreign filing of an application and to that extent implement the Arms Export Control Act, the Export Administration Act, the Atomic Energy Act and the Nuclear Non-Proliferation Act. If a license is obtained from the Commissioner under §5.12, §5.13 or §5.14, no separate approval for the export of technical data to a foreign country in connection with a patent application is required from the export agencies.

It is emphasized that the scope of the Commissioner's license is limited to exporting and filing technical data in the form of an application, or in any form, if related to preparing, filing and prosecuting a patent application or for consideration of the filing of a patent application in a foreign country. A Commissioner's license does not authorize selling or using technical data in a foreign country or exporting data for other purposes. These latter acts continue to require separate approvals from the appropriate export agencies.

Also, the export of technical data in any form to a foreign country for purposes other than related to filing or supporting the filing of a patent application is not controlled by Title 35, U.S.C. or the regulations in Part 5. The exportation of data to a foreign country in such cases would be subject only to other laws and regulations such as the export and arms control regulations. Approval for the export of such technical data for purposes related to filing, possible filing, or supporting the filing of a patent application will be available from the appropriate export agencies or the Commissioner. On the other hand, the Commissioner will be the sole licensing authority for the act of filing the application in a foreign patent office.

Section 5.11(d), proposed as §5.11(b), states that an application cannot be exported to a foreign country when the corresponding United States application is under secrecy order except under §5.5

Section 5.11(e), proposed as §5.11(c), states that no license is required if the invention was not made in the United States, or the application was on file in the United States at least six months and is not under a secrecy order issued under §5.2

Section 5.11(f), proposed as §5.11(d), states that any license for foreign filing may be revoked at any time by written notification. It has been amended to further clarify that revocation also applies to authorizations resulting from the passage of six months from the filing date of a United States patent application when a secrecy order is imposed.

Section 5.12

Section 5.12(b) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.13

Section 5.13 is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.14

Section 5.14(a) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

The other changes in §5.14 make grammatical corrections and do not alter the intent of the section.

Section 5.15

Section 5.15(a) broadens the scope of licenses granted under §5.12(a). Section 5.15(a), as proposed, is changed to clarify the scope of a §5.15(a) license and delete certain of the exclusions originally proposed. This license permits exporting technical data to and filing corresponding subject matter in an application in any foreign country. The license also permits amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application, to be exported and filed in any foreign country. This license includes additional matter which does not change the general nature of subject matter disclosed and does not pertain to certain prohibited subjects or areas listed on various export restriction lists established by the Department of State and the Department of Energy.

These changes also permit an applicant to take action in the prosecution of the foreign or international application and submit supporting data such as affidavits, test data or the like as long as it directly relates to the filing, possible filing or prosecution of the application and does not pertain to the prohibited subjects or areas enumerated in §5.15(a)(4). The changes in §5.15(a) obviate the problems in *In re Gaertner*, supra, by providing a license scope which covers the type of activity involved in that case.

Amended paragraph (b) of §5.15 is the same as proposed paragraph (b) except for changes for consistency.

Amended paragraph (c) of §5.15 differs from §5.15(c) as proposed by including a reference to §5.14 and specifically permitting an applicant to petition for a change of the scope of a license.

New paragraph (d) of §5.15 is similar to proposed paragraph (d) with only changes for consistency.

New paragraph (e) of §5.15 is similar to proposed paragraph (e) with only changes for consistency.

Paragraph (f) of §5.15 is similar to proposed paragraph (f) with only changes for consistency.

Paragraph (g) is adopted essentially as proposed.

Section 5.17

Section 5.17 is similar to proposed §5.17 with only consistency changes.

Section 5.20

Section 5.20, not included in the proposal, is new and clarifies the existing authority of the Commissioner under the unclassified activities in foreign atomic energy programs. Under 10 CFR 810.7, the license of the Commissioner under 37 CFR 5.11 pursuant to 35 U.S.C. 184 constitutes information available to the public and generally authorized activity.

Section 5.25

Section 5.25, proposed initially as §5.20, is new and sets forth the requirements for petitioning for a retroactive license.

Section 5.31 and 5.32

Sections 5.21 and 5.22 are redesignated as §§5.31 and 5.32, respectively.

Section 5.33

Section 5.23 is redesignated as §5.33 and adopted as proposed.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony were considered.

Twenty-one letters presenting written comments were received and nine persons testified at the public hearing on July 20, 1983. Comments appear below along with the responses.

Comment: One comment objected to the amendment of §5.1 to include "transmittal for" filing.

Reply: This comment has been adopted by deleting the phrase from the final rule.

Comment: Three comments requested an explanation of the conditions when a license may be revoked under §5.11(d) be clearly set forth and asked whether, if revocation occurs, past acts are valid and whether there will be compensation for damages.

Reply: The section has been revised to further clarify the conditions under which a license may be revoked. The power to revoke licenses has been expressly included in all issued licenses for a number of years. Section 5.11(d) as proposed, merely recognizes in the rule the fact that licenses can be revoked. With the advent of the filing of a U.S. application becoming a request for a foreign filing license under §5.12(a), a regulatory procedure clarifying the revocation practice was appropriate. Revocation will be effective only as of the date of revocation and prior acts predicated on the license would be in compliance with 37 CFR Part 5. The rule as proposed has been clarified to indicate that revocation may apply either to a license specifically granted by the Commissioner or to an authorization to file a foreign application resulting from the passage of six months from the filing of a United States patent application. No compensation is available for revocation of a license.

Comment: Eighteen comments requested the amendment of §5.11 to eliminate the license requirement for "transmittal for filing" and substitute the requirement for "filing" only.

Reply: The proposal has been adopted by eliminating the requirement for a license from the Commissioner prior to transmitting or exporting an application abroad. The regulations have been clarified to emphasize the requirements for the export of technical data in the form of an application. An applicant has a choice of exporting such applications under authority of either (1) the appropriate export agencies controlling the export of technical data—Department of State; Department of Commerce, International Trade Administration; or Department of Energy or (2) a license from the Commissioner. While a license from the Commissioner is required only for filing an application abroad, the provisions of §§5.18, 5.19 and 5.20 reflect the Commissioner's authority to license the export of technical data in the form of an application for purposes related to filing in addition to the foreign filing of the application in a foreign country.

Comment: Six person objected to the transmittal license requirement and argued that the Patent and Trademark Office lacks authority under 35 U.S.C. 184 to require pre-filing (transmitting) licenses. It was also argued that foreign filing licensing is not the conduct of proceedings under 35 U.S.C. 6.

Reply: The final rules do not require a license from the Commissioner for export (or transmittal). The export provisions of §5.11 are issued under 35 U.S.C. 6 and pursuant to delegations under the regulations of the export agencies.

Comment: One comment argued that the constitutional right of freedom of speech would be impaired by requiring a license for published material.

Reply: A constitutional argument of prior restraint by export licensing of the International Traffic in Arms Regulations was reviewed by the Ninth Circuit in the case of *United States* v. *Edler*, 579 F. 2d 516 (9th Cir. 1978) cert. denied 449 U.S. 1084 (1981). No prior restraint within first amendment protection was found by the Court.

Comment: One comment stated that the $120 petition license fee under §5.12(b) is too high, and a $60 fee would be more reasonable.

Reply: The license fee under §5.12(b), §5.13 and §5.14 is not applicable to routine licensing requests. It is only applicable to expedited processing of license requests which require special efforts by the Patent and Trademark Office. The $120 petition fee better reflects the costs to the Patent and Trademark Office for providing expedited handling.

Comment: One comment proposed the deletion of the last sentence of paragraph §5.14(a) since under §5.12(a) only those cases having interest from a security standpoint are refused a license.

Reply: This suggestion has not been adopted because the provision may apply to petitions filed prior to receipt of a filing receipt license where expedited handling is requested.

Comment: One comment stated that §5.15(d) appears to be redundant since it applies only to cases on file for six months and on which no secrecy order has been imposed.

Reply: Under §5.15(d), a license is not needed for cases in this category if no additional subject matter is added. This section complements §5.15(b) where a license of narrow scope is granted.

Comment: One comment raised the question whether §5.15(a) as to amendments, supplements, and modifications includes continuation-in-part applications.

Reply: Continuation-in-part applications are included within the term "amendments, supplements, and modifications." *Beckman Instruments, Inc.* v. *Coleman Instruments,* 143 USPQ 278 (7th Cir. 1964).

Comment: Two comments requested that the express language in §5.15(a)(3) be amended to state that "Technical Data" relating to articles, materials and supplies be limited to the validated license requirements of §§379.4(c) and 379.4(d) of the Export Administration Regulations and no other sections, or alternatively, that paragraph (a)(3) be deleted in its entirety.

Reply: The final rules do not include §5.15(a)(3) as proposed.

Comment: Two comments proposed that the two-tier licensing structure of §5.15(a) and §5.15(b) be amended to reflect a broad one-tier system based on §5.15(a).

Reply: The two-tier system reflects different treatment for applications within the inspection scope of 35 U.S.C. 181 and those outside of its inspection scope. Security review occurs on all applications with inspection cases having a narrow license grant, and noninspection cases having a broad license grant. This inspection case treatment is necessary for the Patent and Trademark Office to meet its responsibilities under 35 U.S.C. 184 and particularly 37 CFR 5.18, 5.19, and 5.20 where the State, Commerce and Energy Departments accept the Commissioner's licenses in lieu of their own export approval.

Comment: One comment indicated that proposed §5.15(a)(3) was of such wide scope that licenses will always be needed. The example cited was that this section would require licenses for all amendments filed in North Korea and Cuba.

Reply: The comment is correct and the provisions of §5.15(a)(3) have been deleted. The country of destination restrictions did not provide a workable mechanism for technology review under the provisions of 35 U.S.C. 181.

Comment: Three comments recommended making a §5.15(a) scope license available pursuant to a §5.14 petition where an application was filed prior to Feb. 27, 1983, or where an initial automatic §5.12(a) petition was not granted after Feb. 27, 1983 or where the general nature of the invention changed but is still outside of the provisions of §5.15(a)(4).

Reply: This provision has been adopted to allow the Commissioner to issue broadened licenses upon a §5.14 petition in the above circumstances. New §5.15(c) allows the Commissioner to convert the scope of a license from §5.15(b) to a §5.15(a) license.

Comment: Two comments proposed the extension of a §5.15(a) license upon petition after one or more years after the United States filing date or after grant of a §5.15(b) license.

Reply: This suggestion has been adopted in §5.15(c) which will provide the mechanism by petition at any time to convert the scope of a license. This is promulgated since errors may occur in the denial of a §5.15(a) license. Also, the initial determination of the sensitive nature of technology may be altered by changes in the security classification guidelines. Procedurally, such petitions will be referred to the appropriate defense agencies for their review of the technology prior to the grant of any license.

Comment: One comment requested clarification on how and under what circumstances a §5.12(b) license granted under §5.15(c) has the same scope as a license granted under §5.12(a).

Reply: Licenses granted under §5.12(a) will have the §5.15(a) scope because the applications are not within the inspection scope of a 35 U.S.C. 181 referred to the defense agencies for security review. Under §5.15(c), applications which are not referred to defense agencies pursuant to petitions under §§5.12, 5.13 and 5.14 will have a license of the scope of §5.15(a).

Comment: Three comments suggested an amendment to proposed §5.20(4) to delete the "inadvertence" standard and substitute "through error without deceptive intent."

Reply: Inadvertence is a statutory standard which cannot be altered by rulemaking. Further, judge-made law has determined the metes and bounds of this term which further proscribes the rulemaking authority of the Commissioner. In *Barr Rubber Products Co.* v. *Sun Rubber Co.,* 149 USPQ 204, 209 (S.D.N.Y., 1966) inadvertence was defined as "lack of care or attentiveness: inattention" or "an effect of inattention: a result of carelessness; an oversight, mistake, or fault from negligence."

Inadvertence signifies want of attention, and an action which is deliberately taken with full knowledge of the law and facts is not inadvertent. *In re Application of Nov. 22, 1952,* 153 USPQ 410, 411 (Asst. Commr. 1967).

Implementation of Patent Procedure Revisions

The various sections will be implemented by the Commissioner on the effective date of the rules by the acceptance of petitions under the various sections. The broadened license scope of §5.15(a) will apply as of the effective date of these rules to all cases having filing receipt licenses under §5.12(a) which became effective on Feb. 27, 1983. The provisions of this broad license do not apply to acts of export or filing which occurred prior to the effective date of these rules. No other action will be required by an applicant to receive the benefits of this change.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The Acting General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) for several reasons. Under this rulemaking, small entities would be able to obtain licenses without filing separate requests therefor. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, simplifying existing procedures where possible.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in cost or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Paperwork Reduction Act. The collection of information requirement of this rule is included in a

PTO request for approval pending before the OMB. Upon assignment of a control number by OMB, we will publish an appropriate amendment of the affected rules.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Small businesses.

37 CFR Part 5

Classified information, Foreign relations, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41 and 181–188 and by delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, the Patent and Trademark Office is amending Parts 1 and 5 of Title 37 of the Code of Federal Regulations as set forth below:

PART 1—[AMENDED]

1. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of Part 1 or 5 listed below which refers to this paragraph $120.00

—§1.47—for filing by other than all the inventors or a person not the inventor
—§1.48—for correction of inventorship
—§1.182—for decision on questions not specifically provided for
—§1.183—to suspend the rules
—§1.268—for late filing of interference settlement agreement
—§§5.12, 5.13 & 5.14—for expedited handling of foreign filing license
—§5.15—for changing the scope of a license
—§5.25—for retroactive license

2. The table of contents and heading for Part 5 are revised to read as follows:

PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

Secrecy Orders

Sec.
5.1 Defense inspection of certain applications.
5.2 Secrecy order.
5.3 Prosecution of application under secrecy orders; withholding patent.
5.4 Petition for rescission of secrecy order.
5.5 Permit to disclose or modification of secrecy order.
5.6 General and group permits.
5.7 Compensation.
5.8 Appeal to Secretary.

Licenses for Foreign Exporting and Filing

5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting international application.
5.12 Petition for license.
5.13 Petition for license; no corresponding appliction.
5.14 Petition for license; corresponding U.S. application.
5.15 Scope of license.
5.16 Effect of secrecy order.
5.17 Who may use license.
5.18 Arms, ammunition, and implements of war.
5.19 Export of technical data.
5.20 Export of technical data relating to sensitive nuclear technology.
5.25 Petition for retroactive license.

General

5.31 Effect of modification, rescission or license.
5.32 Papers in English language.
5.33 Correspondence.

Authority: 35 U.S.C. 6, 41, 181–188 and the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

3. The center heading preceding §5.11 and the text of §5.11 are revised to read as follows:

Licenses for Foreign Exporting and Filing

§5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No applicaltion on the invention has been filed in the United States.

(b) The license from the Commissioner of Patents and Trademarks referred to in paragraph (a) would also authorize the export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application without separately complying with the regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of the Office of Export Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy).

(c) Where technical data in the form of a patent application, or in any form is being exported for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application, without the license from the Commissioner of Patents and Trademarks referred to in paragraphs (a) or (b) of this section, or on an invention not made in the United States, the export regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) must be complied with unless a license is not required because a United States application was on file at the time of export for at least six months without a secrecy order under §5.2 being placed thereon. The term "exported" means export as it is defined in 22 CFR Parts 121–130, 15 CFR Part 379 and 10 CFR Part 810.

(d) If a secrecy order has been issued under §5.2, an application cannot be exported to, or filed in, a foreign country (including an international agency in a foreign country), except in accordance with §5.5.

(e) No license pursuant to paragraph (a) of this section is required if:

(1) The invention was not made in the United States, or

(2) The United States application is not subject to a secrecy order under §5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country.

(f) A license pursuant to paragraph (a) of this section can be revoked at any time upon written notification by the Patent and Trademark Office. An authorization to file a foreign patent application resulting from the pas-

sage of six months from the date of filing of a United States patent application may be revoked by the imposition of a secrecy order.

4. Section 5.12 is amended by revising paragraph (b) to read as follows:

§5.12 Petition for license.

* * * * *

(b) Petitions for license should be presented in letter form and must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, the petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

5. Section 5.13 is revised to read as follows:

§5.13 Petition for license; no corresponding application.

If no corresponding national or international application has been filed in the United States, the petition for license under §5.12(b) must be accompanied by the required fee (§1.17(h)), if expedited handling of the petition is also sought, and a legible copy of the material upon which a license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition.

6. Section 5.14 is amended by revising paragraphs (a) and (c) to read as follows:

§5.14 Petition for license; corresponding U.S. application.

(a) When there is a corresponding United States application on file, a petition for license under §5.12(b) must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, and must identify this application by serial number, filing date, inventor, and title, but a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.

* * * * *

(c) When the application to be filed or exported abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency for filing in the Receiving Office, must be furnished with the petition. If however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

7. Section 5.15 is revised to read as follows:

§5.15 Scope of license.

(a) Grant of a license under §5.12(a) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority

(1) To export and file all duplicate and formal papers to the foreign country or international agencies;

(2) To make amendments, modifications and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application;

(3) To take any action in the prosecution of the foreign or international application; and

(4) To add subject matter or take any action under paragraphs (a) (1)–(3) of this section which does not change the general nature of the subject matter disclosed at the time of filing, unless the subject matter added involves technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121–130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Grant of a license under §5.12(b) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to forward all duplicate and formal papers to the foreign patent agency or international patent agency and to make amendments, modifications or supplements to and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under §5.12(b) pursuant to §5.13 or §5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. The change in the scope of a license will be as of the date of the grant of the change in scope.

(d) In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter.

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing or which involves the disclosure of subject matter listed in paragraphs (a)(4) (i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under §5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(4) (i) or (ii) of this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under §5.12(b), additional subject matter is not introduced.

(g) A license does not apply to acts done before the license was granted. See §5.25 for petitions for retroactive licenses.

8. Section 5.17 is revised to read as follows:

§5.17 Who may use license.

Licenses may be used by anyone interested in the export, foreign filing, or international transmittal for or on behalf of the inventor or the inventor's assigns.

9. A new §5.20 is added to read as follows:

§5.20 Export of technical data relating to sensitive nuclear technology.

(a) Under regulations (10 CFR 810.7) established by the United States Department of Energy, an application filed in accordance with the regulations (37 CFR 5.11–5.33) of the United States Patent and Trademark Office and eligible for foreign filing under 35 U.S.C. 184, is considered to be information available to the public in published form and a generally authorized activity for the purposes of the Department of Energy regulations.

(b) Inquiries concerning the export of sensitive nuclear technology other than related to the filing or prosecution of a foreign patent application should be made to the Attention: Secretary, United States Department of Energy, Office of International Security Affairs, Washington, D.C. 20858.

§5.21 [Redesignated as §5.31]

10. Section 5.21 is redesignated as §5.31.

§5.22 [Redesignated as §5.32]

11. Section 5.22 is redesignated as §5.32.

12. A new §5.25 is added to read as follows:

§5.25 Petition for retroactive license.

(a) A petition of retroactive license under 35 U.S.C. 184 shall be presented in accordance with §5.13 or §5.14, and shall include:

(1) A listing of the foreign countries in which the patent application material was filed,

(2) The dates on which the material was filed,

(3) A verified statement containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order.

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was inadvertently filed abroad without the required license under §5.11 first having been obtained, and

(4) The required fee (§1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of inadvertence. The showing of facts should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute inadvertence should cover the period from the time of filing until actual filing of the petition under this section.

(b) If a petition for a retroactive license is denied, a time period of not less than thirty days shall be set, during which the petition may be renewed. Failure to renew the petition within the set time period will result in a final denial of the petition. A final denial of a petition stands unless a petition is filed under §1.181 within two months of the date of the denial. If the petition for a retroactive license is denied with respect to the invention of a pending application and no petition under §1.181 has been filed, a final rejection of the application under 35 U.S.C. §185 will be made.

(c) The granting of a retroactive license does not excuse any violation of the export regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) which may have occurred because of the failure to obtain an appropriate license prior to export.

13. Section 5.23 is redesignated as §5.33 and revised to read as follows:

§5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Commissioner of Patents and Trademarks (Attention Licensing and Review), Washington, D.C. 20231."

Feb. 24, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of
Patents and Trademarks.

[FR Doc. 84-8884 Filed 4-3-84; 8:45 am]
BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of May 1, 1984

PP. 5,127	4,396,845	4,415,691	4,423,908
3,940,747	4,398,233	4,416,933	4,423,968
4,185,995	4,399,126	4,417,604	4,423,986
4,244,281	4,399,188	4,418,000	4,424,071
4,258,689	4,399,271	4,418,118	4,424,421
4,292,710	4,399,323	4,418,416	4,424,529
4,292,787	4,399,676	4,418,838	4,424,540
4,309,420	4,399,736	4,419,534	4,424,681
4,322,341	4,402,214	4,419,743	4,424,887
4,357,056	4,402,805	4,419,813	4,424,948
4,357,617	4,404,246	4,419,964	4,425,041
4,362,275	4,408,060	4,420,333	4,425,542
4,368,209	4,408,490	4,420,416	4,425,855
4,368,891	4,408,975	4,420,587	4,425,893
4,369,307	4,409,599	4,421,162	4,426,031
4,374,882	4,409,947	4,421,431	4,426,236
4,377,759	4,411,011	4,421,618	4,426,400
4,380,903	4,411,179	4,422,049	4,426,520
4,382,381	4,412,059	4,422,102	4,428,218
4,384,932	4,412,101	4,422,281	4,428,292
4,385,894	4,412,133	4,422,319	4,428,337
4,390,350	4,412,237	4,422,338	4,428,797
4,391,016	4,412,584	4,422,370	4,429,473
4,391,535	4,412,796	4,422,728	4,429,515
4,393,060	4,414,339	4,422,939	4,430,527
4,394,220	4,414,423	4,423,205	4,430,706
4,394,278	4,414,648	4,423,491	4,431,291
4,394,986	4,415,315	4,423,539	4,431,400
4,395,810	4,415,432	4,423,637	4,431,591
4,396,618	4,415,533	4,423,892	4,433,374
4,396,745	4,415,578	4,423,902	4,434,591

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 31, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Action New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	10-28-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	5-12-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-18-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	3-22-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-19-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	1-26-81
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-16-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	11-04-76
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-23-81

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,307,200 to 3,311,920, inclusive

Plant Patents ..... Numbers 2,723 to 2,729 inclusive

REEXAMINATIONS

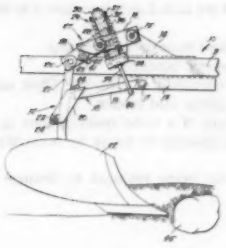
MAY 1, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,321,027 (189th)
SELF-RESTORING PLOW TRIP

Otto E. Johnson, Hinsdale; Roland J. Frase, Palatine, and James Morkoski, Clarendon Hills, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Reexamination Request No. 90/000,110, Nov. 13, 1981.
Reexamination Certificate for Patent No. 3,321,027, issued May 23, 1967, Ser. No. 482,704, Aug. 26, 1965.
Int. Cl.[3] A01B *61/04*
U.S. Cl. 172—260.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–11** is confirmed.

Claim **1**, having been finally determined to be unpatentable, is cancelled.

2. In a plowing implement having a traveling support adapted to be connected to and propelled by a tractor, a plow unit, means mounting the plow unit on the support for tripping thereof from a normal operating position below the surface of the ground to a tripped position above the ground when abnormal draft conditions are encountered while maintaining the vertical position of said traveling support substantially unimpaired, and means in the mounting of said plow unit on the support accommodating automatic return of the plow unit from its tripped position and effective to dispose the plow unit in an attitude conducive to penetration of the plow unit into the ground and return thereof to its normal operating position below the surface of the ground by the propulsive power of the tractor, and without interrupting the forward progress of the implement, said means mounting the plow unit on the support including link means having collapsible elements movable from an uncollapsed condition in the operating position of the plow unit to a collapsed condition in the tripped position of the plow, and means effective to return said collapsible elements to their uncollapsed condition prior to re-entry of the plow unit into the ground.

B1 3,549,540 (190th)
METHOD AND COMPOSITIONS FOR TREATING ALUMINUM SURFACES

David Y. Dollman, Doylestown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Reexamination Request No. 90/000,414, Jul. 1, 1983.
Reexamination Certificate for Patent No. 3,549,540, issued Dec. 22, 1970, Ser. No. 692,725, Dec. 22, 1967.
Continuation-in-part of Ser. No. 590,487, Oct. 31, 1966, abandoned.
Int. Cl.[3] C11D *7/54*
U.S. Cl. 252—105

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

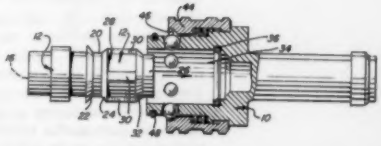
The patentability of claims **1–21** is confirmed.

1. A method for preventing the formation of smut on the surface of copper-bearing aluminum alloys as a consequence of treatment of said surface with an aqueous acidic deoxidizing solution which deoxidizes aluminum comprising establishing and maintaining in said acidic deoxidizing solution an addition agent soluble therein and selected from the class consisting of ferricyanide and nitroprusside and mixtures thereof, and treating aluminum surfaces with said deoxidizing solution to remove therefrom oxide coating on said surface, wherein the amount of said addition agent in said deoxidizing solution is at least sufficient to reduce the tendency of smut to form on said surface as it is treated with said solution.

B1 4,198,080 (191st)
TELESCOPING-TYPE CONNECTOR

Walter L. Carpenter, Richmond, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Reexamination Request No. 90/000,320, Jan. 21, 1983.
Reexamination Certificate for Patent No. 4,198,080, issued Apr. 15, 1980, Ser. No. 907,520, May 19, 1978.
Int. Cl.[3] F16L *27/00, 37/18*
U.S. Cl. 285—277



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended:

Claim **2**, dependent on an amended claim, is determined to be patentable.

New claims **3** and **4** are added and determined to be patentable.

1. In a telescoping-type connector comprising outer and inner *tubular* telescoping members, said inner telescoping member defining an outer circumferential groove and adapted to sealingly fit in telescoping relation within an aperture of the

said outer telescoping member, said outer telescoping member including retention means for releasably projecting a plurality of spaced retaining members into said outer circumferential groove to retain said inner and outer members in sealing, telescoping relation, the improvement comprising, in combination:

said inner telescoping member defining, between said circumferential [grooves] *groove* and the forward end of said inner member relative to said outer member, a recessed portion on its outer surface, and a plurality of circumferentially spaced, longitudinally extending rib members positioned within said recessed portion, said rib members being disposed in a position to prevent at least one of the [retention] *retaining* members of the retention means from being projected into said recessed portion in any rotational position of said inner telescoping member while positioned within the outer telescoping member, *the area occupied by said rib members in the recessed portion being less than the remaining area of said recessed portion which is free of said rib members.*

B1 4,315,798 (192nd)

DECAY RESISTANT SHEET MATERIAL WITH RETAINED FLEXIBILITY

Warren J. Bodendorf, Montgomery, Mass., assignor to Texon Inc., South Hadley, Mass.

Reexamination Request No. 90/000,296, Nov. 22, 1982.
Reexamination Certificate for Patent No. 4,315,798, issued Feb. 16, 1982, Ser. No. 177,778, Aug. 13, 1980.
Int. Cl.[3] **D21H** *5/22*
U.S. Cl. 162—161

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **5**, having been finally determined to be unpatentable, are cancelled.

Claim **2** is determined to be patentable as amended:

Claims **3** and **4**, dependent on an amended claim, are determined to be patentable.

New claims **6–25** are added and determined to be patentable.

2. A synthetic sheet material comprising:
an acrylic elastomeric binder;
fibers *consisting essentially of cellulosic fibers* uniformly distributed throughout said binder;
a sufficient amount of a metal-quinolinolate to render said sheet material resistant to decay by microbial organisms; and
said sheet material being resistant to flexural degradation upon aging.

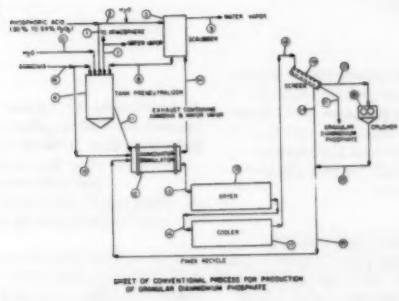
DEFENSIVE PUBLICATIONS

PUBLISHED MAY 1, 1984

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T104,201
PRESSURE REACTOR FOR PRODUCING DIAMMONIUM PHOSPHATE
David G. Salladay, 520 Line St., NE., Decatur, Ala. 35601, and Frank P. Achorn, Robbins Beach Rd., Killen, Ala. 35645
Filed Oct. 3, 1983, Ser. No. 538,714
Int. Cl.[3] C05B 7/00
U.S. Cl. 71—34
2 Sheets Drawing. 26 Pages Specification



SHEET OF CONVENTIONAL PROCESS FOR PRODUCTION OF GRANULAR DIAMMONIUM PHOSPHATE

Process for producing diammonium phosphate (DAP) fertilizer from phosphoric and sulfuric acids, anhydrous ammonia and water in a specially designed reactor operated at high pressures to granulate diammonium phosphate at low recycle ratios and with either no, or relatively small, fossil fuel requirement drying per ton of product. By operating at elevated pressures, it is possible to force ammonia into a high temperature (250° to 300° F.) melt without exceeding the recovery capacity of the acid fed to the scrubber. The high pressure slurry from the reactor is forced into the bed of materials in a rotary granulator. Previously operated reactors employed pressures ranging from 0 to 10 psig pressures. This reactor operates at 40 to 80 psig. The process substantially increases production in existing DAP granulation plants and has helped reduce grade deficiencies. Also, use of this reactor for DAP production results in about the same levels of ammonia loss to the scrubber as the prior-art tank preneutralizer, higher operating factors, less maintenance and no transfer pump plugging. Operation is at a temperature of 250° F. to 300° F., or more, while the tank preneutralizer operates normally at 240° F.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,569

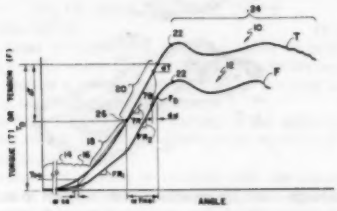
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Original No. 4,179,786, dated Dec. 25, 1979, Ser. No. 912,151, Jun. 2, 1978. Continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. Application for reissue Dec. 21, 1981, Ser. No. 332,802

Int. Cl.[1] **B23P** *19/06*

U.S. Cl. 29—407 **55 Claims**



51. A method of tightening a multiplicity of substantially identical joints having components including at least one threaded fastener to a final desired stress value below the yield point of all joint components that can be correlated with stress, including:

tightening the fastener with an instructable tool;

sensing torque at various angles of advance during tightening below the yield point of all joint components that can be correlated with stress;

calculating, while tightening below the yield point of all joint components that can be correlated with stress, the stress appearing in the fastener at least at one instant of tightening below the yield point of all joint components that can be correlated with stress from the sensed values of torque and angle;

determining the value of a tightening parameter sufficient to tighten the fastener to the final desired stress value below the yield point of all joint components that can be correlated with stress from the calculated stress;

instructing the tool to tighten the fastener to the determined parameter; and

terminating tightening in response to the attainment of the determined parameter.

Re. 31,570

FLUID FLOWMETER

Charles F. Drexel, Los Angeles County, Calif., assignor to Tylan Corporation, Carson, Calif.

Original No. 3,851,526, dated Dec. 3, 1974, Ser. No. 349,169, Apr. 9, 1973. Application for reissue Feb. 5, 1982, Ser. No. 346,422

Int. Cl.[1] **G01F** *5/00*

U.S. Cl. 73—202 **10 Claims**

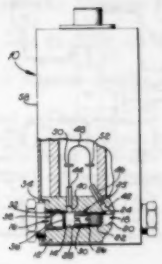
1. A flowmeter comprising:

a housing having a fluid inlet and a fluid outlet defining a first fluid path therebetween *and aligned along a first direction;*

a flow restrictor in said first fluid path comprising at least one disk having a front surface and a rear surface connected by a perimeter surface, an opening through said front and rear surfaces and at least one conduit through said perimeter surface to said opening, said conduit being of a length to diameter ratio to provide laminar flow;

means for supporting said restrictor in said first fluid path whereby the flow therethrough is directed radially in either direction, *normal to said first direction,* between the perimeter and the opening of said at least one disk;

an elongate conduit defining a laminar flow second fluid path;



means for measuring the rate of flow of fluid through said elongate conduit; and

means for connecting said second fluid path in parallel with said first fluid path on opposite flow sides of said flow element, *said housing being constructed to as to redirect said radially directed flow to flow parallel to said first direction.*

Re. 31,571

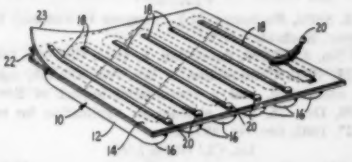
MULTIPLE COMPARTMENT PACKAGING

Anne V. Mann, 3154 Sawtell Blvd. #4, Los Angeles, Calif. 90066

Original No. 4,232,787, dated Nov. 11, 1980, Ser. No. 26,136, Apr. 2, 1979. Application for reissue Nov. 8, 1982, Ser. No. 439,929

Int. Cl.[1] **B65D** *85/20, 75/58, 77/32*

U.S. Cl. 206—443 **6 Claims**



1. A sealed package for holding a plurality of [food] units comprising:

a base receptacle with compartments for holding individual [food] units;

a lid piece for covering said base receptacle and each of said compartments and for maintaining in an airtight state individual [food] units within individual ones of said compartments;

and opening means associated with each of said compartments and forming a part of said lid piece for individually opening each of said compartments to remove [food] units without disturbing the integrity of the remaining compartments and

wherein said opening means comprising a beaded strip formed in said lid and extending along each of said compartments.

Re. 31,572

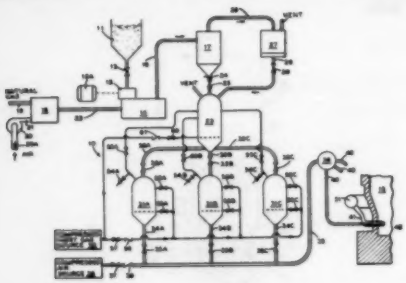
PULVERIZED FUEL DELIVERY SYSTEM FOR A BLAST FURNACE

Earl E. Coulter, Akron; Fritz L. Hemker, Wadsworth, and Elias A. Kazmierski, Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Original No. 3,720,351, dated Mar. 13, 1973, Ser. No. 140,905, May 6, 1971. Division of Ser. No. 799,773, Feb. 17, 1969, abandoned, and a continuation of Ser. No. 248,377, Mar. 27, 1981, abandoned. Application for reissue Aug. 16, 1982, Ser. No. 408,142

Int. Cl.³ B67B *7/00*

U.S. Cl. 222—1 **9 Claims**



5. [A method according to claim 1 including the steps of] *A method of supplying pulverized fuel to a blast furnace which comprises introducing a quantity of pulverized fuel into a tank, pressurizing the tank with an inert gas, communicating the tank with the furnace to allow flow of pulverized fuel thereto under the influence of the gas pressure in the tank, and adjusting said gas pressure in accordance with the flow rate of combustion air to the blast furnace to correspondingly the regulate flow rate of pulverized fuel thereto,* sensing the weight of said tank to determine the delivery rate of pulverized fuel into the furnace, converting raw fuel into pulverized fuel at a rate equal to said delivery rate, and storing the pulverized fuel resulting from such conversion for subsequent transfer into said tank to replenish the pulverized fuel supply thereof.

Re. 31,573

FILM CARTRIDGE ASSEMBLY WITH PRESSURE PLATE

Gurdip S. Sethi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,309,096, dated Jan. 5, 1982, Ser. No. 161,792, Jun. 23, 1980. Continuation of Ser. No. 372,851, Apr. 28, 1982, abandoned, and a continuation-in-part of Ser. No. 106,630, Dec. 26, 1979, abandoned. Application for reissue May 27, 1983, Ser. No. 497,220

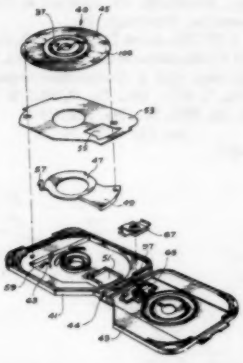
Int. Cl.³ G03B *1/48*

U.S. Cl. 354—121 **13 Claims**

1. In a photographic film cartridge assembly having front and rear opposed walls between which film is movable [to align image areas with] *across* an exposure window in the front wall *to align image areas with the exposure window for exposure, the film remaining in said cartridge following such exposure,* and wherein the rear wall has an opening generally aligned with the exposure window through which the film's front surface can be pressed, by a force exerted against the rear surface of the film, against a film support surface of a camera in which the cartridge assembly is received to locate an image area in the camera's exposure plane; the improvement comprising:

a pressure plate;

means for retaining said pressure plate between the film and the rear wall in alignment with the exposure window and the opening *before and after exposure,* with a degree of freedom to permit movement of said pressure plate toward and away from the front wall, whereby a force is exerted against the rear surface of the film when said pressure plate is moved toward the front wall, *said retaining means comprising a pair of oppositely extending legs projecting from said pressure plate, one of said legs having a dimension which is less than the corresponding dimension of the other leg and discontinuity means of the rear wall of the*



cartridge assembly associated with said legs so as to inhibit orientation of said pressure plate relative to the rear wall in all but the proper orientation; and

baffle means on said pressure plate and the rear wall for forming a tortuous light path to prevent light which enters said cartridge assembly through the opening from reaching the film *before and after exposure.*

Re. 31,574

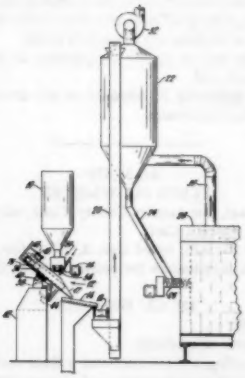
APPARATUS FOR HANDLING HEAT-SOFTENABLE BATCH MATERIAL

Stephen Seng, Frazeysburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Original No. 4,212,613, dated Jul. 15, 1980, Ser. No. 965,632, Dec. 1, 1978. Division of Ser. No. 809,595, Jun. 24, 1977. Application for reissue Jan. 27, 1982, Ser. No. 343,057

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—141 **15 Claims**



1. In an apparatus for pelletizing a batch of particulate material, said apparatus comprising pellet forming means having a movable surface comprising a slanted rotatable member, means for moving said surface, means for supplying particulate batch material to said pellet forming means, means for supplying

liquid to said pellet forming means, said apparatus being so arranged and constructed that said liquid and particulate batch material combine to form pelletized batch material, the improvement comprising means for directly sensing the depth of the batch material on said pellet forming means, and means for changing the ratio of the liquid to the particulate material in response to a change in the depth which is sensed.

Re. 31,575
SULFUR COMPOUNDS AND METHOD OF MAKING SAME

Allen C. Ludwig; John M. Dale, and Henry F. Frazier, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Original No. 4,290,816, dated Sep. 22, 1981, Ser. No. 7,042, Jan. 29, 1979. Application for reissue May 6, 1983, Ser. No. 492,183

Int. Cl.[3] **C09K** *3/00;* **C08L** *101/00*

U.S. Cl. 106—287.32 **18 Claims**

1. A process for modifying elemental sulfur to produce a [material] *sulfur reaction product* having properties such that it can be used as a substitute for asphalt or portland cement comprising reacting elemental sulfur:

(1) with from 5 to 20 weight percent of the sulfur *reaction product* of a first hydrocarbon containing from 4 to 20 carbon atoms;

(a) which is a diolefin or triolefin with the unsaturated portion being reactable with elemental sulfur; and

(b) which by itself when reacted with elemental sulfur forms a gel; and

(2) with from 5 to 20 weight percent of the sulfur *reaction product* of a second hydrocarbon containing from 2 to 20 carbon atoms;

(a) which is a monolefin reactable with elemental sulfur; and

(b) which by itself when reacted with sulfur does not form a gel but forms a brittle product; and

(c) which when the first and second hydrocarbons are so reacted with sulfur prevents said gel from forming;

(3) said reaction being initiated by heating the reactants to a temperature in the range of 120° to 200° C. and sufficiently high to cause an exothermic reaction between the reactants; and

(4) producing a *sulfur reaction* product having a viscosity curve substantially that of asphalt, a penetration of from 5 to 100, a softening point of from 10° C. to 70° C. and a ductility of at least 100.

Re. 31,576
COMPOSITIONS CONTAINING PRESERVATIVE METALS AND THEIR USE FOR THE PRESERVATION OF WOOD AND LIKE MATERIALS AND AS FUNGICIDES

Edward A. Hilditch, Frome, England, assignor to Cuprinol Limited, Somerset, England

Original No. 4,193,993, dated Mar. 18, 1980, Ser. No. 904,606, May 10, 1978. Application for reissue Mar. 11, 1982, Ser. No. 357,225

Claims priority, application United Kingdom, May 19, 1977, 20089/77

Int. Cl.[3] **A01N** *55/02, 59/00, 59/16, 59/20*

U.S. Cl. 424—141 **58 Claims**

1. In an aqueous ammoniacal preservative composition comprising: [p1]

(a) a composition of a preservative metal selected from the group consisting of copper, zinc, cobalt, iron, manganese and nickel;

(b) an organic acid; and

(c) an ammoniacal compound selected from the group consisting of ammonia, ammonia compounds, and mixtures thereof, the amount of ammoniacal compound being at least sufficient to solubilize said compound (a) and to neutralize said acid (b), the improvement wherein said organic acid is a branched chain carboxylic acid having 6 to 20 carbon atoms, a [dipentene] *dicyclopentadiene* monocarboxylic acid, a [dipentene] *dicyclopentadiene* dicarboxylic acid, or a mixture thereof present in a preserving amount.

Re. 31,577
REACTIVE TERMINALLY UNSATURATED LIQUID POLYMERS IN UNSATURATED POLYESTERS

Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Original No. 4,274,994, dated Jun. 23, 1981, Ser. No. 159,088, Jun. 13, 1980. Division of Ser. No. 73,160, Sep. 6, 1979, Pat. No. 4,256,904. Application for reissue Jun. 21, 1983, Ser. No. 506,558

Int. Cl.[3] **C08L** *67/06*

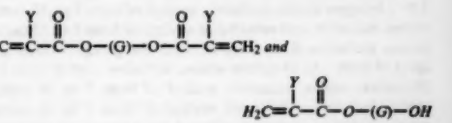
U.S. Cl. 523—514 **13 Claims**

1. An unsaturated polyester molding composition comprising:

(a) An unsaturated polyester resin,

(b) A polymerizable vinyl monomer, and

(c) From about 2 to about 30 weight parts of a terminally unsaturated liquid epihalohydrin polymer having the formula



wherein Y is hydrogen or methyl, and G is a polymeric backbone comprising polymerized units of at least one epihalohydrin.

Re. 31,578
α(SUBSTITUTED) AMINO-3-SUBSTITUTED-2-ISOXAZOLINE-5-ACETIC ACIDS (ESTERS)

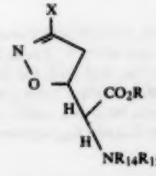
Robert C. Kelly, and Wendell Wierenga, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Original No. 4,256,898, dated Mar. 17, 1981, Ser. No. 62,857, Jul. 31, 1979. Continuation-in-part of Ser. No. 905,963, May 15, 1978, abandoned. Application for reissue Feb. 28, 1983, Ser. No. 470,743

Int. Cl.[3] **C07D** *261/04*

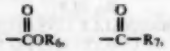
U.S. Cl. 548—240 **21 Claims**

1. Racemic mixtures and optically active isomers of compounds having the formula

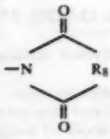


wherein R is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 3 halogen atoms, and 1 to 5 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive; X is selected from the group consisting of bromine, chlorine, [fluorine and iodine,]—OR_1, —SR_1, and —$NR'R''$ wherein R_1 is selected from the group consisting of alkyl of from 1 to 12 carbon atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive; R'

and R'' are the same or different and are selected from the group consisting of hydrogen and alkyl of from 1 to 8 carbon atoms, inclusive, R_{14} and R_{15} are selected from the group consisting of hydrogen,

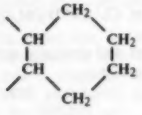


inclusive, or when taken together with the nitrogen atom form the group

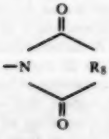


wherein R_6 is alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive, R_7 is selected from the group consisting of alkyl of from 1 to 12 carbon atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, substituted aralkyl of from 7 to 20 carbon atoms, inclusive, and R_8 is selected from the group consisting of (a)

where R_9, R_{10}, R_{11} and R_{12} are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive, (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene, with the proviso that when R, R_{14} and R_{15} are all hydrogen, X cannot be chlorine, and with the further proviso that when X is chlorine and R is either hydrogen or lower alkyl of from 1 to 8 carbon atoms, inclusive, neither R_{14} nor R_{15} can be alkoxycarbonyl nor can R_{14} and R_{15} together with the nitrogen atom be the group



wherein R_8 is defined as above.

Re. 31,579

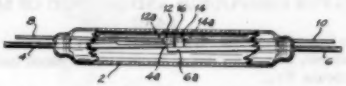
SHUTTERLESS FIBER OPTIC SWITCH

James R. Jaeschke, Waukesha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 4,146,856, dated Mar. 27, 1979, Ser. No. 865,435, Dec. 29, 1977. Application for reissue Apr. 7, 1980, Ser. No. 138,373

Int. Cl.³ H01H *51/06*

U.S. Cl. 335—151 **6 Claims**



4. [The switch according to claim **3**] *A shutterless fiber optic switch comprising: actuation means comprising first and second members at least one of which is movable between actuated and unactuated positions;*

first and second fiber optic cables;

alignment means comprising first and second support means mounting respectively said first and second fiber optic cables to said first and second members such that in said actuated positions said cables are colinearly aligned in facing end to end relation to permit transmission of light therebetween thus forming a closed optical circuit, and such that in said unactuated position said cables are misaligned to prevent transmission of light therebetween;

one of said first member and said first support means being stopped against one of said second member and said second support means when said at least one member is in said actuated position to afford accurate alignment of said fiber optic cables, the coaxis of said fiber optic cables being perpendicular to the line of travel of said at least one member, said first support means mounting said first fiber optic cable at a distance D1 spaced in the direction of said line of travel from said first member, said second support means mounting said second fiber optic cable at a distance D2 spaced in the direction of said line of travel from said second member such that in said actuated position the distance between said second fiber optic cable and said first member in the direction of said line of travel is substantially equal to D1, and wherein said first member is stopped against said second member in said actuated position, and wherein D2 substantially equals D1 plus the thickness of said first member.

Re. 31,580

INSULATED GATE FIELD-EFFECT TRANSISTOR COMPRISING A MESA CHANNEL AND A THICKER SURROUNDING OXIDE

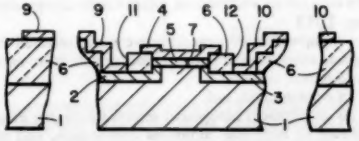
Else Kooi, Los Altos, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 3,544,858, dated Dec. 1, 1970, Ser. No. 727,563, May 8, 1968. Application for reissue Sep. 25, 1980, Ser. No. 191,031

Claims priority, application Netherlands, Jun. 8, 1967, 6707956

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23 **7 Claims**



1. An insulated gate field-effect transistor comprising a semi-

conductive body of silicon of one type conductivity having a surface portion comprising a silicon mesa standing a given height above the surface portion and comprising a channel region of said transistor, spaced source and drain regions of the opposite type conductivity adjacent the surface portion and the mesa and on opposite sides of the mesa, a first layer of an insulating material constituted at least in part of silicon oxide on and adherent to the body surface at least at portions overlying the source and drain regions and at adjacent portions of the body surrounding the source, drain and channel regions, the entire interface between said first insulating layer portions and the body lying below [tre] *the* mesa top, a second layer of an insulating material *directly* on the top surface of the mesa and adjoining the first insulating layer portions adjacent thereto, each of said insulating layers having a thickness in a direction corresponding to its smallest dimension, the portions of said first insulating layer at least overlying the source and drain regions and the said adjacent portions of the body having a thickness at least equal to the given height of the mesa such that the said insulating layer portions extend to a height in their thickness direction at least equal to that of the mesa and the top surfaces of said first insulating layer portions extend substantially parallel to said surface portion and at the level of or above the mesa top, said second insulating layer having a thickness substantially smaller than that of the first insulating layer portions, a gate electrode having a portion on the second insulating [layers] *layer*, a source electrode having a portion on the first insulating layer and electrically connected through an opening therein to the source region, and a drain electrode having a portion on the first insulating layer and electrically connected through an opening therein to the drain region, *the second insulating layer lying between the gate electrode and the silicon mesa top consisting entirely of silicon oxide.*

PLANT PATENTS

GRANTED MAY 1, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,225

CHRYSANTHEMUM PLANT NAMED SPLENDOR

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 31, 1982, Ser. No. 413,570
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name of Splendor as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; light lavender ray floret color; diameter across face of capitulum ranging from 145 to 160 mm. at maturity; uniform nine (9) week flowering response; medium plant height and upright branching pattern.

5,226

CHRYSANTHEMUM PLANT NAMED YELLOW CAMBRIA

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 31, 1982, Ser. No. 413,508
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., known by the cultivar name of Yellow Cambria, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; spider capitulum type; yellow ray floret color; diameter across face of capitulum ranging from 175 to 225 mm. at maturity; uniform nine (9) week flowering response; tall 90 to 95 cm. plant height when grown single stem with no long days and a low temperature tolerance of 13° C. (55° F.) for initiation and development under controlled short days with a continuous dark period of 12 to 14 hours.

5,227

CHRYSANTHEMUM PLANT NAMED FAVOR

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 31, 1982, Ser. No. 413,601
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Favor, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; bronze red ray floret color; diameter across face of capitulum ranging from 80 to 120 mm. at maturity; uniform nine (9) week flowering response; medium plant height and spreading branching pattern.

PATENTS

GRANTED MAY 1, 1984

ERRATA

For CLASS	See PATENT NO.
114–355	4,445,244
502–355	4,446,057
428–648	4,446,156
346–216	4,446,209
315–111	4,446,403
368–048	4,446,491

PATENTS

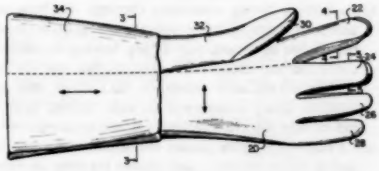
GRANTED MAY 1, 1984

GENERAL AND MECHANICAL

4,445,231
BIB HAVING GRAVITATIONALLY OPENABLE POCKET
John R. Noel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 19, 1983, Ser. No. 486,573
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—49 R **8 Claims**

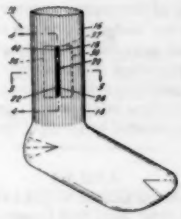
1. A bib comprising a top panel, a substantially full-width pocket panel disposed at the bottom end of said top panel, an apron panel, and means for securing said bib on a user, said pocket panel having a transverse upper edge and said apron panel having a transverse top edge which is coextensive with said transverse upper edge of said pocket panel so that said apron panel pendulously depends from said transverse upper part of said pocket, and said pocket panel having vertically extending side edges which are secured to adjacent edge regions of said top panel but for an unsecured zone of each said side edge disposed adjacent said transverse upper edge whereby said transverse upper edge is disposed at a higher elevation than the uppermost ends of the secured portions of said side edges, said bib further having a central surface portion of said pocket panel disposed adjacent said transverse upper edge secured in face-to-face relation to a central surface portion of said apron panel disposed adjacent said top edge thereof.

4,445,232
WELDERS GLOVE
Larry D. Nelson, 1341 Loch Lomond, Cardiff, Calif. 92007
Filed May 24, 1982, Ser. No. 381,204
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **8 Claims**



1. A welders glove for protecting the hand of a welder from burning during welding, said glove comprising:
a glove constructed of at least one panel of deer skin leather cut and shaped to define a hand covering with separate finger and thumb pockets, and a cuff extending over the wrist, wherein at least the portion of said panel covering the back of the hand is oriented with the stretch axis transverse to the longitudinal axis of the hand; and
a thermal lining covering the lower portion of the hand.

4,445,233
HOSIERY WITH INCLUDED POCKET
Robert Rubin, 39-24 213rd St., Bayside, N.Y. 11361
Filed Aug. 19, 1983, Ser. No. 524,925
Int. Cl.³ A41B *11/00*
U.S. Cl. 2—239 **10 Claims**



1. Hosiery with included pocket, comprising:
a hosiery piece including a foot portion and a tubular leg portion for covering at least part of the leg of a wearer;
a slit opening formed in the leg portion extending a first length therealong; the slit opening having first opposite sides, and closure means for selectively opening and closing the slit opening by respectively securing the first sides together and by releasing that securement;
a flexible pocket enclosure inside the leg portion and having a width greater than the distance between the opposite sides of the slit opening, with the closure means closing the slit opening;
the pocket being defined by a plurality of walls; an opening through one of the walls of the pocket; the pocket opening also being defined by second opposite sides thereof in the respective pocket walls; each of the pocket second opening opposite sides being secured to the leg portion generally at a respective one of the first opposite sides of the first opening in the hosiery piece.

4,445,234
PROSTHETIC NAIL FOR SURGICAL ATTACHMENT TO A FINGER OR TOE
E. Olayinka Ogunro, 625 Ray Ave., DeSoto, Tex. 75115
Filed Jul. 19, 1982, Ser. No. 399,477
Int. Cl.³ A61F *1/00, 1/24*
U.S. Cl. 3—1 **7 Claims**

1. A prosthetic nail adapted for use on one of the digits of a person's hand or foot, comprising the combination of:
(a) a nail plate comprising a slightly curved sheet having proximal and distal ends and a longitudinal axis extending therebetween, and the plate being adapted to be placed on top of the distal end of a digit so that the longitudinal axis extends in the same general direction as the distal philan-

geal bone of the digit, and said plate being slightly curved as viewed in a transverse plane so as to approach the generally cylindrical cross-sectional shape of a typical digit, and said plate having a thin edge at its proximal end that is adapted to be at least partially buried within the eponychial fold of the digit;

(b) an anchor member extending downwardly from the distal end of the nail plate, and there being a space in excess of 1 mm between the lower surface of said plate and a lower portion of the anchor member, whereby, at least some tissue of a person's digit may be wedged between a lower portion of the anchor member and the nail plate, and whereby the wedged tissue can resist the movement of the nail plate away from the distal phalangeal bone; and

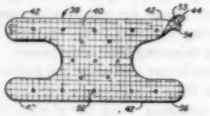
(c) means for providing lateral stability for the nail plate when it is mounted on a digit, and said means including at least one depending edge near its proximal end that is adapted to be covered by tissue of the digit.

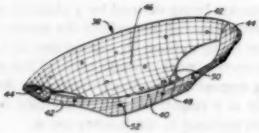
4,445,235

STOOL SPECIMEN COLLECTOR

Pearl Slover, 345 Sybil Ave., San Leandro, Calif. 94577, and Robert R. Moore, 1897 National Ave., Hayward, Calif. 94545

Filed Sep. 13, 1982, Ser. No. 417,197
Int. Cl.³ A47K *11/00*
U.S. Cl. 4—144.2 **3 Claims**





1. A stool specimen collector for use by a medical patient for collection of a stool specimen comprising:

a flat, flexible water-resistant material having a perforated central portion with four projecting, integral strap elements with two shaped parallel elements projecting in a pair from each opposite side of said central portion, said strap elements having distal ends with attachment means for attaching the strap elements to a toilet, wherein on use of said collector, said distal ends in each pair are connected and attached to opposite sides of the top of a conventional toilet, said central portion forming an open cradle receptacle with a depressed center and raised periphery, said receptacle being supported below the seat of the toilet, above the bowl water for receiving the feces of a user and wherein said center portion and said four projecting integral strap elements are formed from a one piece pattern.

4,445,236

PUSH-THROUGH PUMP

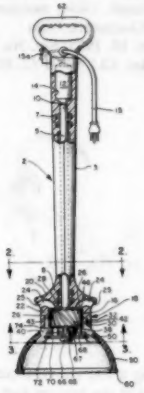
Henry Nadolny, and Henryka A. Nadolna, both of 5045 N. Mango Ave., Chicago, Ill. 60630

Filed Feb. 7, 1983, Ser. No. 464,388
Int. Cl.³ E03D *11/00*
U.S. Cl. 4—255 **6 Claims**

1. A combination pump and plunger for unplugging stoppages in toilets and the like comprising a housing forming a handle portion having a vacuum cup at one end,

a pump mounted at said one end of the handle portion within the upper end of the cup,

means providing selectively operable openable and closable passage means into said cup and through said pump and



out and into said housing for filling and exhausting the pump, and means for reversing said pump,

and means for reversing said pump comprising a reversible motor operably connected to the pump.

4,445,237

CLOSE COUPLED WATER-CLOSET COMBINATION AND ADAPTER

Robert M. Paul, Ambler, Pa., assignor to Partnership of Robert M. Paul, Amber, Pa.

Filed Aug. 30, 1982, Ser. No. 413,049
Int. Cl.³ E03D *11/00*
U.S. Cl. 4—417 **11 Claims**

1. A close coupled water-closet combination comprising:

a source of water under pressure,

a conduit connected at one end to said source, said conduit containing a time controlled valve for controlling the flow of water through said conduit, and

an adapter coupled to the other end of said conduit for coupling said conduit to a toilet bowl, said adapter including:

(a) a substrate having a hole therethrough;

(b) fasteners on opposite sides of the hole for attaching said substrate to said toilet bowl;

(c) a hollow fitting extending through the hole and attached to said substrate and extending both above and below the substrate, said fitting having threads on the outer surface thereof for at least that portion of said surface above said substrate, said other end of said conduit being connected to said fitting, said fitting below said substrate having a flared circumference; and

(d) a hollow, flexible gasket frictionally attached to said fitting circumference, said gasket forming an extension of said fitting, said gasket abuts an opening in the toilet bowl to allow water to pass from said source of water under pressure to said toilet bowl.

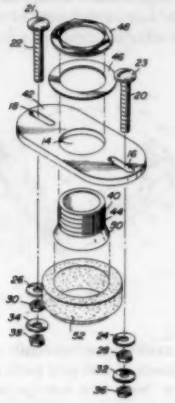
6. An adapter to couple a toilet bowl to a flush device comprising:

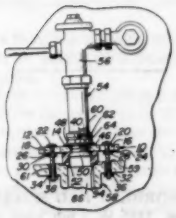
(a) a substrate having a hole therethrough;

(b) fasteners on opposite sides of said hole for attaching said substrate to a toilet bowl;

(c) a hollow fitting extending through the hole and attached to said substrate and extending both above and below the substrate, said fitting having a flared circumference for

that portion of said fitting disposed below said substrate; and





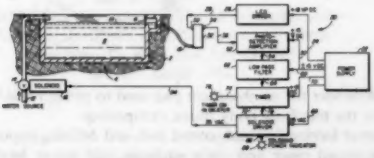
(d) a hollow, flexible gasket frictionally attached at the upper end thereof to said fitting circumference below said substrate to form an extension of said fitting.

4,445,238

SWIMMING POOL WATER LEVEL CONTROL APPARATUS

Monroe R. Maxhimer, 10202 N. 46th Ave., Glendale, Ariz. 85302

Filed Sep. 29, 1982, Ser. No. 426,988
Int. Cl.[3] E04H *3/18*
U.S. Cl. 4—508 **6 Claims**



1. Swimming pool water level control apparatus, comprising, in combination:

means for sensing the water level in the swimming pool located remotely from the swimming pool, including

means for sensing a preferred water level in the pool and for sensing a water level less than the preferred water level; and

control means for controlling water flow to the swimming pool in response to the means for sensing the water level, including

means for providing a first output signal in response to the sensing of a water level less than the preferred water level,

timer means actuated by the first output signal for providing a second output signal for a predetermined time period,

valve means for controlling a flow of water to the swimming pool, and

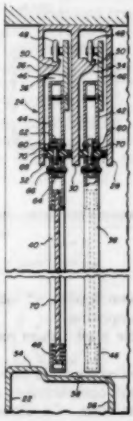
means activated by the second output signal for opening the valve means for the predetermined time period to allow water to flow to the swimming pool during the predetermined time period.

4,445,239

SUSPENDED SHOWER-TUB DOORS WITH UPPER STABILIZING MEANS

Ralph E. Jacobsen, 42 Afton Dr., Florham Park, N.J. 07932

Filed Aug. 24, 1982, Ser. No. 410,897
Int. Cl.[3] A47K *3/14*; A47H *15/04*; E03D *15/06*
U.S. Cl. 4—607 **7 Claims**



1. A shower enclosure structure for the ingress and egress zone for and from a tub-shower area and disposed above the marginal edge of the outer wall of the lower tub portion of said area, said enclosure structure including an upper horizontal rail structure for stationary support in elevated positions spaced above said upper marginal edge, said rail structure defining depending laterally spaced inner, outer and intermediate flange portions with inner and outer downwardly opening channels defined between the inner side of the intermediate flange portion and the outer side of the inner flange portion and between the outer side of the intermediate flange portion and the inner side of the outer flange portion, the upper portions of said inner and outer flange portion, the upper portions of said inner and outer channels including upwardly facing inner and outer track means therein spaced appreciably above the lower marginal edges of said flange portions, a pair of upstanding inner and outer sliding doors having upper marginal edge portions slidingly received within said inner and outer channels and equipped with opposite end support roller means rollingly engaged with the corresponding track means at points spaced longitudinally there along for suspended support of said inner and outer doors from said inner and outer track means, the opposite ends of the upper marginal edge portion of each of said doors including inner and outer guide roller means journaled therefrom about upstanding axes and projecting outwardly from at least the inner and outer sides, respectively, of the upper marginal edge portion of the corresponding door below the corresponding support rollers and above the lower marginal edges of the corresponding flange portions, said inner and outer guide roller means of said inner door being disposed

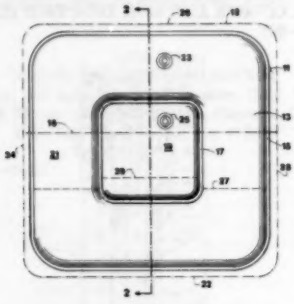
for guiding rolling contact with the outer and inner surfaces of said inner and intermediate flanges, respectively, and the inner and outer guide roller means of said outer door being disposed for guiding rolling contact with the outer and inner surfaces of said intermediate and outer flanges, respectively, said doors including lower marginal edge portion free of guide roller means for guiding engagement with a stationary guide structure.

4,445,240

LIQUID FILLED COMPARTMENTED CUSHION

John Voorhees, Wichita, Kans., assignor to Ideal Comfort, Inc., Wichita, Kans.

Filed Aug. 7, 1978, Ser. No. 931,842
Int. Cl.[3] A47C *27/10*
U.S. Cl. 5—451 **15 Claims**



1. A covered cushion having at least two compartments containing a liquid comprising

two pieces of flexible plastic sheet material of substantially the same shape,

said pieces being sealed together around their periphery to form a liquid-tight compartment and further having a joining seal in the form of a closed path in the central portion thereof dividing said compartment into two isolated portions, the first portion being centrally located in said cushion and the second portion completely surrounding the first portion,

a filler port with a closure therefor in one of said pieces of sheet material placed to give access to the said first portion of said compartment,

another filler port with a closure therefor in one of said pieces of sheet material placed to give access to the said second portion of said compartment.

4,445,241

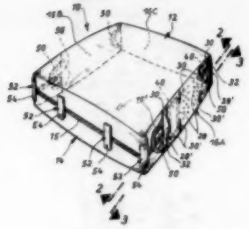
COVER FOR PILLOWS, MATTRESSES AND THE LIKE

Sigrid Ender, and Ottmar Ender, both of Stuttgarter Str. 125, D-7022 Leinfelden 1, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,209
The portion of the term of this patent subsequent to Nov. 1, 2001, has been disclaimed.
Int. Cl.[3] A47G *9/00*; A47C *31/08*
U.S. Cl. 5—468 **12 Claims**

1. An improved air-tight and fluid-tight cover for padded bodies, mattresses and the like, wherein the cover has at least one ventilation opening for regulating the temperature and humidity of the padded body which is enclosed by the cover, and including means for filtering the air circulating between the cover and the ambient atmosphere, said cover having a top part, a bottom part and a plurality of side parts, at least two side parts of said plurality of side parts being formed by means of a plurality of contiguous layers of material, comprising at least one inner, one outer and one middle layer, the inner and middle layer of said parts having air passage openings, which are offset with respect to each other, and at least one filter means being disposed between the middle and outer layers of said side parts, the improvement comprising in combination

said inner, middle and outer layers of material being connected to each other by means of a plurality of first con-



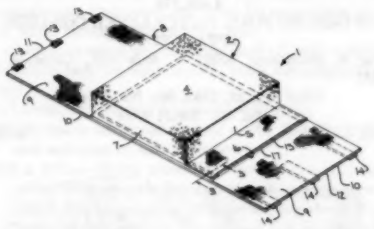
necting seams extending substantially transversely to the longitudinal extents of said side parts across a portion of their widths, at least two contiguous first connecting seams defining at least one pocket therebetween, said filter means being disposed in said pocket.

4,445,242

ABSORBENT PAD HOLDER

Charlotte M. Bowen, 2235 W. Club View Dr., Glendale, Wis. 53209

Filed Apr. 5, 1982, Ser. No. 365,178
Int. Cl.[3] A47G *9/04*; A61G *9/00*
U.S. Cl. 5—484 **8 Claims**



1. A holder for an absorbent pad used to protect seat cushions or the like from body fluids, comprising:

a cover having first and second ends and defining oppositely disposed inner and outer surfaces, said cover having a sufficient length such that said first and second ends extend around to the underside of a cushion;

fastening means disposed adjacent said first and second ends for removably fastening said ends to one another; and

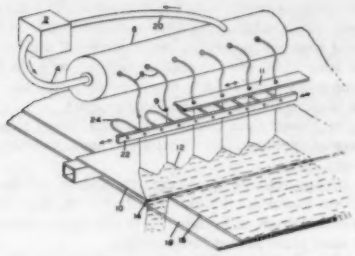
a panel attached to the inner surface of said cover along its periphery except for one side thereof to provide a pocket having an opening receiving an absorbent pad, said panel and pocket positioned so that the pad will substantially overlie the sitting portion of a cushion, said pad including an impervious layer disposed adjacent to said panel and an absorbent layer disposed adjacent to said inner surface.

4,445,243

PARTICLE INK APPLICATION

Walter J. Bohrn, and Peter J. Sydorko, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 26, 1982, Ser. No. 401,922
Int. Cl.[3] D06B 1/06
U.S. Cl. 8—151 5 Claims



1. A method of applying dye to a carpet comprising the steps of:

(a) supplying the dye from a supply tank to a manifold which has its length extending across the full width of the carpet to be dyed,

(b) removing the dye from the manifold by passing the dye through a plurality of nozzle tubes positioned along the length of the manifold,

(c) flowing the dye from the nozzle tubes onto a flood plane plate positioned above the carpet to be dyed,

(d) inclining the flood plane plate means towards the carpet to be dyed and passing the dye from the point where it drops on the flood plane plate means to the edge of the plate means above the carpet with the dye spreading out on the surface of the plate means whereby dye will flow over the total edge of the plate in a waterfall manner, and

(e) the improvement comprising:

(1) continuously circulating the dye between the supply tank and the manifold by supplying dye at a rate over three times that needed for the nozzle tubes to create turbulent flow in the manifold and to agitate the dye within the manifold to prevent separation of the dye particles and the dye carrier, and

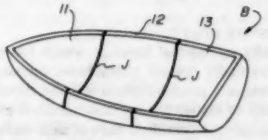
(2) positioning an oscillating bar with plural finger means between the ends of the nozzle tubes and the flood plane plate means whereby the finger means will break up the flow of dye from the nozzle tubes so that the dye falls non-uniformly onto the plate means.

4,445,244

SECTIONAL BOAT JOINT CONSTRUCTION

Stephen E. Wilce, P.O. Box 962, Winters, Calif. 95694

Filed Mar. 13, 1980, Ser. No. 130,085
Int. Cl.[3] B63B 7/04
U.S. Cl. 114—355 C 4 Claims



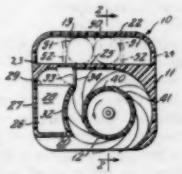
1. A joint construction for a sectional boat comprising, in combination, a plurality of boat hull sections adapted to be detachably connected together in an assembled condition to form a boat, each of said hull sections having a transversely extending edge portion for engagement in longitudinally aligned relationship with the edge portion of the adjacent hull section in the assembled condition of said boat, interlocking means on said hull edge portions for detachably retaining said hull sections together in said assembled condition, said interlocking means including outwardly extending flange means on each of said edge portions for mutual overlapping relationship in said assembled condition to define a transversely extending cavity therebetween, at least one inflatable bladder having an outer wall disposed within said cavity and means for inflating said at least one bladder to move said bladder outer wall into frictional gripping engagement with both of said flange means to retain said flange means in said overlapping relationship and to form a leakproof seam between said adjacent hull sections, said flange means, when forced into contact by the inflation of said bladder, acting as the primary structural connection between said adjacent hull sections wherein said interlocking means include at least one projection and at least one aperture in corresponding positions on said adjacent hull sections, the disposition of said projection and aperture being such that, the inflation of said bladder positioning said projection within said aperture, said projection and aperture lock said hull sections against relative motion.

4,445,245

SURFACE SWEEPER

Ning K. Lu, 31-29 Crescent St., Long Island City, N.Y. 11106

Filed Aug. 23, 1982, Ser. No. 410,530
Int. Cl.[3] A47L 5/26
U.S. Cl. 15—23 2 Claims



1. A miniature surface sweeper comprising: a housing element having a wall defining a curvilinear inner surface; a dust receptacle disposed at a part of said housing element opposite said wall, said receptacle being removable for emptying; a rotary brush element including a cylindrical surface disposed between said wall and said dust receptacle, and having flexible bristles thereon in the form of a comblike member, the base of which is secured to said cyclindrical surface, said housing element having an intake opening through which the tips of bristles may project to directly engage collected particles; and means for driving said brush element to rotate the same in the direction delivering collected particles along said curvilinear surface to said dust receptacle; said driving means including an electric motor and a power source therefor; said dust receptacle having a closable trap, said power source including a manually movable electric switch coupled to said trap for simultaneous movement, wherein moving said switch to closed position serves to open said trap.

4,445,246

TENSIONING DEVICE FOR WRAPAROUND BRUSHING MECHANISM

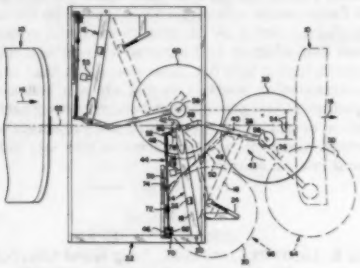
Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Filed Aug. 2, 1982, Ser. No. 404,279
Int. Cl.[3] B60S 3/06
U.S. Cl. 15—53 AB 4 Claims

1. In a wraparound brushing device having a support structure positioned at one side of a path of a car advanced forwardly along the path; an inner arm and an outer arm, the inner

arm at one end thereof being pivotally mounted to the support structure about a fixed axis, and the outer arm being pivotally mounted intermediate its ends to the outer end of the inner arm; a rotary brush carried by the outer arm at its outer end; and a biasing mechanism for the brush forcibly to engage sequentially the front end, side, and rear end of the car as it advances along the path, the improvement comprising:

an adjustable tensioning means operatively coupled to the inner end of the outer arm and the biasing mechanism to provide adjustment means for varying the amount of leverage attainable to swing the outer arm about its pivot axis and for selecting a desired location on the car for application of a particular brush engagement force, the



adjustable tensioning means including an element mounted to and extending from the inner end of the outer arm, the element having separate first and second adjustment means,

the first adjustment means comprising means to receive the biasing mechanism and means to change the effective length of the element to vary the amount of leverage applied pivotally to move the outer arm; and

the second adjustment means comprising means selectably to mount the element in a plurality of positions lying in a plane generally parallel to the plane formed by the inner and outer arms to vary the point of maximum influence of the biasing mechanism and thereby fix the location on the car for application of maximum brush engagement force.

4,445,247

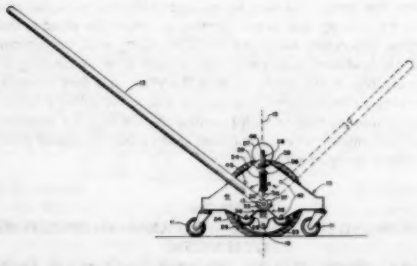
WATER COLLECTING DEVICE

R. L. Johannessen, Box 7040, Richmond, Va. 23221

Filed Jan. 7, 1983, Ser. No. 456,578

Int. Cl.³ E01H *1/00*; A47L *11/00*

U.S. Cl. 15—98 **6 Claims**



1. A device for removing water from a substantially flat surface comprising

(a) carriage means comprised of paired spaced-apart side members each having an outer face and inner face, and each supporting two caster wheels in horizontally spaced-apart juxtaposition, and spanning means interconnecting said side members in a manner such that said caster wheels, four in total in a rectangular array, are disposed to ride upon the same plane,

(b) handle means pivotably engaging each side member,

(c) an elongated collecting vessel extending between the inner faces of said side members and having a configuration which is substantially symmetrical about a vertical plane containing the axis of elongation of said vessel, said vessel having a collecting opening disposed adjacent its uppermost extremity which funnels down to a narrowed throat region entering the interior of said vessel, and drain means adjacent the lowermost extremity of said vessel,

(d) at least three idler wheels associated with each side member in a circular locus in a plane perpendicular to the axis of elongation of said collecting vessel,

(e) an apertured rigid circular cylindrical drum rotatively mounted upon said idler wheels and enveloping said collecting vessel,

(f) a porous resilient absorbent material of substantially uniform thickness releasably attached to the outer periphery of said drum, and positioned to ride upon substantially the same plane as said caster wheels,

(g) an elongated squeeze roll rotatively supported by said side members in a position above said absorbent material, the axis of said squeeze roll being within the plane of symmetry of said vessel and parallel to the axis of elongation of said vessel, and

(h) positioning means associated with the outer faces of said side members and interactive with said handle means to cause vertical movement of said squeeze roll, thereby causing said squeeze roll to either engage said absorbent material in a manner to exert compressive force thereupon, or disengage said absorbent material,

(i) whereby, rolling moving of the device enables said absorbent material to take up water from said ground surface, and the compressive action of the squeeze roll displaces water from said absorbent material, causing said displaced water to flow by gravity into said collecting vessel.

4,445,248

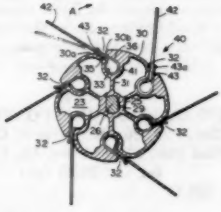
ROTARY STRIPPER

James M. Hait, San Jose, Calif., assignor to International Hardware, Inc., Bridgewater, N.J.

Filed Jun. 4, 1982, Ser. No. 384,978

Int. Cl.³ A46D *9/02*; A46B *7/10*; A47L *13/08*

U.S. Cl. 15—198 **15 Claims**



1. A rotary stripper, comprising:

a generally cylindrical housing which has a plurality of circumferentially spaced pheripheral openings, and which is rotatable in a predetermined angular direction;

a plurality of blades having arm portions projecting through said peripheral openings, each of said blades having a longer work contacting flexing arm and a shorter reaction arm, both composed of springy flexible material,

each longer arm having opposite leading and trailing sides,

each shorter reaction arm having a trailing surface in confronting relation with said leading side of said longer flexing arm of one of said blades and adapted to be con-

tacted by the last named flexing arm during its forward movement in said direction,

said surface of said reaction arm being contoured to yieldingly resist the impact of the confronting longer flexing arm and to limit the stresses set up in said longer arm, to a range which avoids producing fatigue failure in said longer flexing arm upon impact on and rebound from said surface of said reaction arm; and

means defining a curved abutment surface on said housing at each of said peripheral openings on said trailing side of each adjacent longer flexing arm in position to be contacted by said flexing arm during its rearward movement upon contact with a work surface,

said abutment surface being contoured to progressively engage said flexing arm to limit the stresses set up therein upon contact with and rebound from said abutment surface, to a range of stress which will avoid producing fatigue failure in said longer flexing arm during impact with said abutment surface and rebound therefrom.

4,445,249

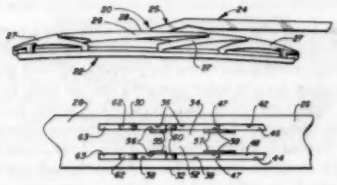
ROCK-TO-LOCK CONNECTION ARM-TO-BLADE

William H. Harbison, and Michael G. Mohnach, both of Valparaiso, Ind., assignors to The Anderson Company of Indiana, Gary, Ind.

Filed Mar. 30, 1982, Ser. No. 363,554

Int. Cl.³ B60S *1/40*

U.S. Cl. 15—250.32 **30 Claims**



1. An apparatus for connecting a wiper arm to a wiper blade, said blade having a pair of side walls and a top wall, comprising:

first and second parallel slots separated by a center portion having a predetermined width and extending through the wiper blade, the center portion being integral with the remainder of the wiper blade;

at least one means carried by the blade for retaining the blade on the arm;

a pin extending between the side walls of the wiper blade and traversing both of the slots;

first and second parallel tabs disposed on the wiper arm and separated by a predetermined distance equal to the width of the center portion, each of said tabs having a pin engaging means disposed at one end thereof; and

means on the wiper arm for coacting with said means on the blade for retaining the blade on the arm, whereby the first and second tabs extend into the first and second parallel slots respectively with the pin engaged by both of the pin engaging means and the means on the blade engaging with the means on the arm for retaining the blade on the arm.

4,445,250

PAINT CASE

Allen W. Seidl, South St. Paul, Minn., assignor to Thomas B. Tate, South St. Paul, Minn., a part interest

Filed Jan. 31, 1983, Ser. No. 462,409

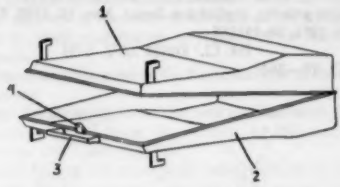
Int. Cl.³ B44D *3/12*

U.S. Cl. 15—257.06 **1 Claim**

1. A paint case comprising:

a first paint tray having a shallow front portion sloping gradually to a deeper back portion, said first paint tray also having a hinge pin mounted on its exterior back surface;

and a second paint tray of similar shape and depth as said first tray, aligned vertically and with its interior facing the interior of said first tray, said second tray having hinge pin



hook means mounted on its exterior back surface and capable of engaging said hinge pin mounted on said first tray so as to allow said paint case to be closed and opened and said paint trays to be separated;

said second tray also having a handle and lip catch release means mounted on its exterior front surface.

4,445,251

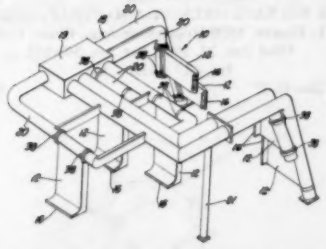
ADJUSTABLE CLAMP FOR FLUID STRIPPING BAG

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed Sep. 28, 1982, Ser. No. 425,685

Int. Cl.³ B08B *1/00*

U.S. Cl. 15—316 R **8 Claims**



1. An apparatus (**10**) for stripping fluid from the surface of an object, said apparatus (**10**) comprising: a flexible inflatable bag (**12**) including an elongated bag inlet (**14**) having a predetermined cross-sectional area and an elongated opening at one end thereof defining a nozzle (**16**); a plenum (**20**), said bag inlet (**14**) being mounted on said plenum (**20**) for the flow of air from said plenum (**20**) into said bag (**12**); first and second bag-retaining rods (**30**) extending the length of said bag inlet (**14**) on each side thereof; seating means (**32**) disposed between said retaining rods (**30**) for positioning said retaining rods (**30**) and having an outer surface (**34**); and hinging control means for selectively varying said cross-sectional area of said bag inlet (**14**) and characterized by including a hinging control rod (**50**) and adjustable connecting means (**52**, **54**) for connecting said hinging control rod (**50**) to said first retaining rod (**30**) and adjacent to said outer surface (**34**) of said seating means (**32**) and against an opposite side of said bag (**12**) relative to said first retaining rod (**30**) to vary the position of said hinging control rod (**50**) along said outer surface (**34**) of said seating means (**32**) to engage said bag (**12**) at varying degrees to selectively vary said cross-sectional area of said bag inlet (**14**).

4,445,252

DRAFTING APPARATUS IN SPINNING MACHINE

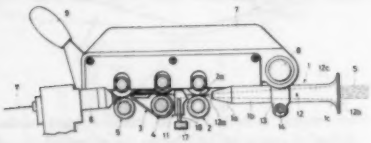
Toshifumi Morihashi, Shiga; Koshi Noda, Joyo; Teruo Nakayama; Shinichi Nishimura, both of Shiga, and Michiaki Fujiwara, Kameoka, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 13, 1981, Ser. No. 320,871

Claims priority, application Japan, Nov. 14, 1980, 55-161291; Oct. 9, 1981, 56-161868

Int. Cl.³ D01H 5/72, 5/86

U.S. Cl. 19—244 4 Claims



1. A drafting apparatus which comprises a pair each of upper and lower back rollers, apron-provided middle rollers and front rollers arranged in sequence along the advance direction of a sliver to be spun, characterized in that a substantially cylindrical elongated sliver guide having a sliver passageway gradually reducing in diameter thereof along the advance direction of sliver is disposed in front of the back rollers wherein an adjusting guide which provides with a sliver passageway at the top portion thereof and a setting groove at the bottom portion thereof is arranged between the back rollers and the middle rollers, said sliver passageway being formed to have an outlet being laterally narrower than an inlet to form a taper and said setting groove being slidably fitted and secured on a supporting plate.

4,445,253

QUICK RELEASE HELMET AND STRAP ASSEMBLY

Thomas L. Howey, 1678 Hooke Oak Ave., Chico, Calif. 95926

Filed Jun. 21, 1982, Ser. No. 390,173

Int. Cl.³ A42B 7/00

U.S. Cl. 24—68 E 10 Claims

1. A quick release helmet and strap securing assembly comprising:

a helmet having a visor,

chin strap means for releasably holding said helmet in place, said chin strap means including a first strap secured to one side of said helmet and carrying a pair of adjacent D-rings, and a second strap secured to the other side of said helmet for threading through both of said D-Rings and then back through the outer one of said pair of D-rings to hold the chin straps in the tightened condition;

means for releasing said chin strap means with one hand, said releasing means including means for slidably engaging said second strap between the point where it goes through both of said D-rings and the point where it extends back through the outer D-ring, and holding means secured to said engaging means for exerting releasing force on said second strap using only one hand; and

means for retaining said releasing means to said chin strap means to prevent loss of said releasing means from said assembly,

whereby under emergency conditions, for example, when a wasp or a bee is trapped inside a motorcycle rider's helmet visor, the helmet may be easily released and removed with only one hand, with the other hand available to safely guide the motorcycle.

4,445,254

HOSE BAND CLIP

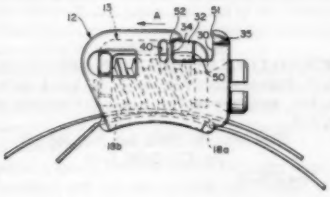
Kurt Allert, Panoramaweg 3, D-7238 Oberndorf/Neckar, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,332

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130007

Int. Cl.³ F16L 33/08; B65D 63/00

U.S. Cl. 24—274 R 7 Claims



1. Hose band clip with a tightening strap and a turnbuckle, the turnbuckle being secured to one end of the tightening strap and having a turnbuckle worm for cooperating with gearing of the tightening strap in order to exert a tension force for adjusting the tightening strap, said turnbuckle worm being connected to a housing of the turnbuckle, wherein narrow openings are formed in longitudinal sidewalls of the housing of the turnbuckle in such a manner that deformable wall portions are formed which are subjected to a force, corresponding to said tension force, that is transmitted by said turnbuckle worm to the turnbuckle housing during said adjusting of the tightening strap, whereby, when the tightening strap is tightened to a predetermined extent, said narrow openings are deformed by deformation of said deformable wall portions due to said force which is transmitted by the turnbuckle worm to said housing of the turnbuckle to provide an optical indication that the tension force is not to be increased any further in order to prevent overloading of the turnbuckle or the tightening strap.

4,445,255

HOSE CLAMP FOR SUPPORTING A VERTICALLY EXTENDING CONTROL LINE

Ingo W. V. Olejak, Houston, Tex., assignor to Koomey, Inc., Brookshire, Tex.

Filed May 19, 1982, Ser. No. 379,606

Int. Cl.³ F16L 3/08; B65D 63/00

U.S. Cl. 24—284 6 Claims

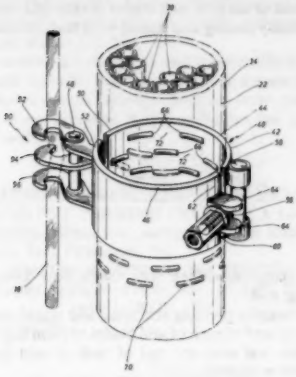
1. A hose clamp for supporting a vertically extending flexible control line having a plastic outer jacket containing a plurality of control lines from a vertical support comprising,

a circular body having semi-circular halves pivotally connected at one side and having coacting locking means at their second sides for encircling the control hose,

the interior of said body including a plurality of projections extending inwardly and positioned in a plan perpendicular to the longitudinal axis of the body,

said hose including matching and coacting acting preformed recesses on the exterior of the hose extending into but not through the plastic jacket for mating with the projections when the clamp is locked on the hose for providing vertical support of said hose,

means connected to the body for securing the body to the vertical support a plurality of circular rows of arcuate



projections vertically spaced with the projections of adjacent rows being rotationally offset relative to each other.

4,445,256

METHOD OF MANUFACTURING PIEZOELECTRIC RESONATOR COMPONENTS

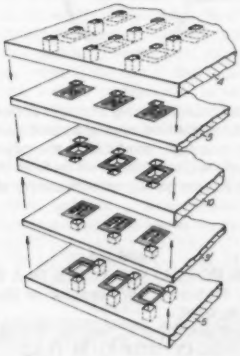
Raymond Huguenin, Preles, and Gottfried Kuechli, Bienne, both of Switzerland, assignors to Dryan-Fordahl Technologies S.A., Bienne, Switzerland

Division of Ser. No. 164,378, Jun. 30, 1980, abandoned. This application Feb. 3, 1982, Ser. No. 345,283

Claims priority, application Switzerland, Jul. 5, 1979, 6283/79

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **5 Claims**



1. A manufacturing process for electric components each of which include at least one piezoelectric resonant element wherein

n layers of piezoelectric material are blanked so as to form on each layer m resonant elements and surrounding zones which constitute frame supports for said elements to which said elements remain attached (where m and n are integers and $m>n\geq 1$);

electrodes are deposited on the resonant elements and metallized tracks electrically coupled to the electrodes on each surface of the surrounding zones, said tracks being of a metal or alloy of low melting point;

n−1 intermediate layers are formed from piezoelectric material so as to have openings surrounded by frames of the same dimensions as the frame supports to place said frames in registry with said frame supports;

metal tracks are deposited on each surface of said intermediate layers;

two terminal layers are formed from piezoelectric material so as to have on inner surfaces thereof blind cavities and frame surfaces of the same dimensions as the frame supports to place said frames in registry with said frame supports;

metal tracks are deposited on the frame surfaces of the terminal layers;

openings are provided in at least said terminal-layer frames permitting access from the exterior to the metallized tracks on said frame supports;

the several layers are assembled under vacuum or partial vacuum in the presence of a noble or inert gas by bringing them into contact after correct positioning thereof with the two terminal layers sandwiching said layers of piezoelectric material separated by said intermediate layers therebetween;

the assembly is brought to a temperature above the melting point of the metal or alloy and then cooled until solidification of said metal or alloy;

only thereafter cutting through the layers between resonant elements for separating the assembled layers into various individual components each component being composed of portions of the assembled layer; and

the connection wires are then attached.

4,445,257

CONVEYOR SHAFT PROVIDED WITH RUBBER ROLLERS, AND METHOD AND APPARATUS FOR MAKING SAME

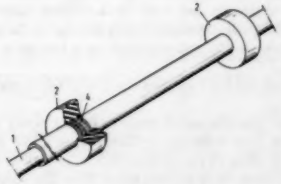
Johannes C. Delhaes, Voerendaal, Netherlands, assignor to Rubber-en Kunststoffabriek ENBI B.V., Netherlands

Filed Jan. 22, 1981, Ser. No. 227,186

Claims priority, application Netherlands, Aug. 29, 1980, 8004930; Jan. 5, 1981, 8100005

Int. Cl.³ B65G *39/04*

U.S. Cl. 29—117 **3 Claims**



2. A driven conveyor shaft provided with rubber rollers driven along therewith, characterized in that each rubber roller is constructed as one unitary and integral component having a radially springing element vulcanized therein, by means of which the rollers are clamped on the shaft, said radially springing element being a helical spring.

4,445,258

METHOD OF SEALING INTERFACES OF BEARING SURFACES TO STEEL BARRELS OF PISTON PUMPS

George R. Caldwell, Black River, and Edward J. Gallagher, Watertown, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 26, 1982, Ser. No. 342,943

Int. Cl.³ B22D *19/00*

U.S. Cl. 29—156.7 R **9 Claims**

1. The method of contemporaneously sealing cylinder barrel inserts and valve face inserts of bearing material in a rotary cylindrical barrel for a reciprocal piston pump or motor wherein the cylinder barrel, after machine finishing, will have

a valving face at one end and an opposite end face from which pistons project from machined cylinder inserts comprising the steps of:

(a) fabricating a steel barrel blank having a series of longitudinal bores which extend through the blank longitudinally from one end to the other, said bores having an intermediate restricted diameter portion for connecting a valve face area at one end of the blank with a cylinder area at the other end thereof,

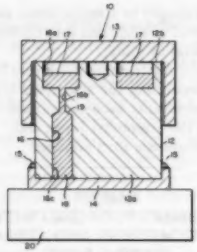
(b) inserting cylindrical inserts of bearing material within the cylinder area,

(c) inserting valve face bearing material in the valve face area,

(d) securing a metal cap over the cylinder area to prevent leakage of bearing material from the cylinder area,

(e) covering the valve face area with a carbon hot top for controlling the cooling of the valve area after removal of the barrel from a metallurgical furnace,

(f) heating the steel barrel blank, disposed vertically in the



furnace with the cylinder and valve bearing materials both inserted, and the metal cap at the bottom of the steel barrel and the hot-top on the top of the steel barrel, for a heating period of approximately 90 minutes at approximately 1925° F.,

(g) removing the steel barrel blank from the furnace at the end of the heating period when the cylinder and valve bearing materials are both in a molten state, with the barrel blank still assembled with the cap at the bottom and the hot top on top and placing it on a heat-sink pedestal to cool, and

(h) removing the hot top after the barrel has cooled to below 1000° F.,

(i) whereby the restricted portion in the bores connecting the valve area with the cylinder area allow for venting and out-gassing of the cylinder bores as well as feeding the cylinder bores with molten metal from the valve face area as solidification takes place gradually of the bearing material from the bottom to the top of the barrel at a controlled rate.

4,445,259

METHOD OF MANUFACTURING BLADED ELEMENTS FOR ROTARY FLUID MACHINES

Ragnar Ekbom, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Aug. 13, 1982, Ser. No. 407,989

Claims priority, application Sweden, Aug. 27, 1981, 8105073

Int. Cl.[3] **B21K** *3/04;* **B23P** *15/02, 15/04*

U.S. Cl. 29—156.8 B **5 Claims**

1. A method of manufacturing a bladed element of a rotary fluid machine, comprising the steps of:

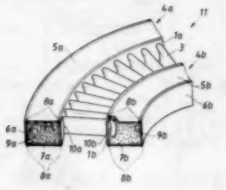
providing a first annular metal wall with blade receiving openings therethrough;

securing said first wall to at least one second metal wall to form a hollow casing;

securing a plurality of metal blades in gas-tight manner in respective openings in said first wall, with one end of each of said blades extending through and beyond said first wall;

filling said casing with metal powder which surrounds said one end of each of said blades within said casing;

hermetically sealing said casing with said one end of each of



said blades extending into the hollow interior of said casing; and

hot isostatically pressing said filled and sealed casing around said one end of each of said blades to form said casing, said powder and said one end of each of said blades into a bonded monolithic body.

4,445,260

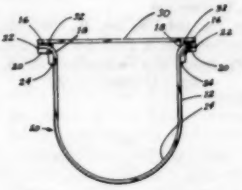
METHOD OF MANUFACTURE FOR METAL TROUGH

David L. Buss, 120 E. Kraus St., St. Louis, Mo. 63111

Division of Ser. No. 186,899, Sep. 15, 1980. This application May 5, 1983, Ser. No. 491,736

Int. Cl.[3] **B21D** *19/14, 51/04*

U.S. Cl. 29—157 R **8 Claims**



1. A method of manufacturing a trough comprising welding a bar along each longitudinal edge of a metal sheet, forming the metal sheet into a trough, and bending the edges of the metal sheet and the bars welded thereto away from the body of the trough forming flanges having smooth curves along each side of the trough.

4,445,261

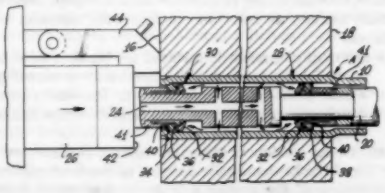
METHOD FOR INSTALLING TUBES IN A TUBE SHEET

John W. Kelly, Burbank, Calif., assignor to Haskel, Incorporated, Burbank, Calif.

Filed Jul. 28, 1980, Ser. No. 173,142

Int. Cl.[3] **B23P** *15/26, 11/02*

U.S. Cl. 29—157.4 **8 Claims**



1. A method for installing a tube in a tube sheet comprising: inserting a tube into a bore that extends through said tube

sheet, said tube having an outside diameter slightly smaller than the diameter of said bore;

applying hydraulic pressure internally to said tube to expand said tube radially throughout a first pressure zone that extends axially along said tube, within said bore, at least up to one end of said bore; and

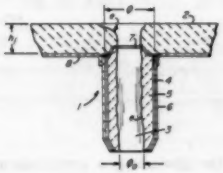
applying increased hydraulic pressure internally to said tube to expand said tube radially throughout a second pressure zone that overlaps said first pressure zone and extends axially along said tube, within said bore, but not to said end of said bore.

4,445,262

PROCEDURE FOR REBUILDING THE MOVABLE PLATE IN THE POURING VALVE OF A LADLE

Romano Cappelli, Milan, Italy, assignor to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Filed Dec. 21, 1982, Ser. No. 451,677
Claims priority, application Italy, Apr. 12, 1982, 25757 A/81
Int. Cl.³ B23P *7/04*
U.S. Cl. 29—402.08 **4 Claims**



1. Procedure for rebuilding a movable plate in the pouring valve of a ladle, according to which the portions around the pouring hole are removed and rebuilt using suitable prefabricated parts of refractory material, or packed directly "in situ" to replace the parts removed; characterized by the fact that it consists of the removal of an upper element of the flat part of the plate (1) over an area (ϕ, L) which is greater in width than the diameter that fits within the thickness (4) of the refractory putty placed between the nozzle (5) and its casing (6), and less than the minimum width (a) of the plate (1); removal of the nozzle (5); replacement of the nozzle thus removed (5) with a nozzle (5'), which is either prefabricated or packed "in situ", with a height less than that of the nozzle that was removed (5); replacement of the upper element that was removed with a stepped upper element (9, 9'') which has an upper width (ϕ_c, L') slightly smaller than the width (ϕ, L) of the upper element that was removed to allow for the interposition of a layer (10) of refractory putty, and with a lower annular part with an external diameter (ϕ_1) corresponding to the external diameter (ϕ_1) of the nozzle (5') and with a total height (h_2) greater than the height (h_1) of the flat part of the plate (1).

4,445,263

METHOD OF PREFORMING A BOOSTER CASING ELEMENT WITH ITS REINFORCEMENT

Jean-Jacques Carré, Le Raincy, and Roland Levrai, Stains, both of France, assignors to Societe Anonyme DBA, Paris, France

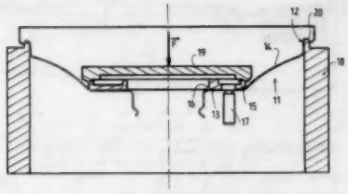
Filed Feb. 1, 1982, Ser. No. 344,277
Claims priority, application France, Feb. 19, 1981, 81 03271
Int. Cl.³ B21D *3/10*
U.S. Cl. 29—445 **6 Claims**

1. A method of forming a casing element of a braking assistance booster, said casing element having a peripheral assembly sleeve portion, a flat annular central fixing base portion with an inner face axially spaced from said sleeve portion and an intermediate web portion integral with said sleeve portion and said base portion and interconnecting same, at least one annular reinforcement member being positioned adjacent the inner face of the base portion, the method comprising the following steps:

preforming the casing element to the required transverse dimensions;

positioning said casing element on a stationary annular frame, said casing element being supported on said frame by its said peripheral sleeve portion;

installing the annular reinforcement member on said inner face of said base portion; and



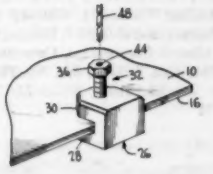
applying on said reinforcement member installed on said base portion a uniform controlled force in the direction perpendicular to said base portion and opposite said sleeve portion to stress said intermediate web portion to the desired final shape.

4,445,264

TOOL FOR A METHOD OF FORMING DIMPLES IN SHEET METAL FOR RECESSING RIVET HEADS

Carl Banerian, 25110 W. Chicago, Redford, Mich. 48239

Filed Mar. 9, 1982, Ser. No. 356,357
Int. Cl.³ B23P *9/00*
U.S. Cl. 29—445 **7 Claims**



1. A hand-operated device for forming a dimple in a workpiece to permit recessing of a head of a fastener and for permitting in a continuing operation the drilling of a hole centered in the formed dimple, said device comprising a forming member which is externally threaded having a dimple-forming end, mounting means mounting said forming member for axial movement, said mounting means including a workpiece support and a carrier for said forming member, and said workpiece support including a recessed seat aligned with said forming member for cooperation with said forming member to dimple said workpiece; and said forming member having a drill pilot bore extending axially therethrough whereby after a dimple has been formed in a workpiece a fastener receiving bore centered relative to the dimple may be drilled through the workpiece.

4,445,265

SHRINK GRIP DRILL PIPE FABRICATION METHOD

Wallace F. Olson, Eufaula, Okla., and Ned Rodgers, Midland, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

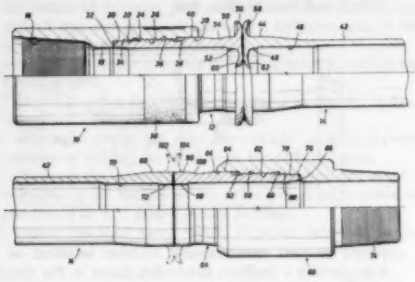
Filed Dec. 12, 1980, Ser. No. 215,809
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—447 **8 Claims**

1. A method of fabricating drill pipe comprising the steps of:

forming a first tubular tool joint body having a threaded pipe connection formation at one end;

connecting the other threaded end of said first tool joint

body to one threaded end of a first tubular adapter member by a threaded shrink grip connection;
connecting the other end of said first adapter member to a first end of a tubular pipe body by welding;
forming a second tubular tool joint body having a threaded pipe connection formation at one end;



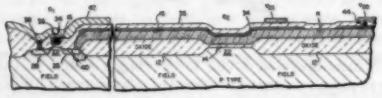
connecting the other threaded end of said second tool joint body to one threaded end of a second tubular adaptor member by a threaded shrink grip connection;
and welding the other end of said second adaptor member to a second end of said pipe body opposite said first end, whereby said drill pipe may be threadably connected to other threaded drill pipes.

4,445,266

MOSFET FABRICATION PROCESS FOR REDUCING OVERLAP CAPACITANCE AND LOWERING INTERCONNECT IMPEDANCE

Chao C. Mai, Dallas; William M. Whitney, Plano; William M. Gosney, McKinney, and Donald J. Gulyas, Sanger, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Aug. 7, 1981, Ser. No. 290,833
Int. Cl.[3] **H01L** *21/22, 21/28*
U.S. Cl. 29—571 **30 Claims**



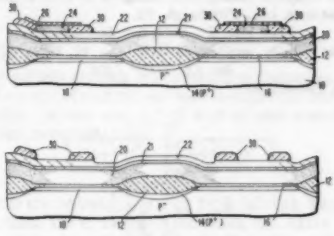
1. A method for fabricating a conducting structure for an integrated circuit comprising the steps of:
forming an insulating layer on a semiconductor substrate;
forming a polycrystalline silicon layer on said insulating layer, said layer having a propensity for oxidation;
forming an oxidation resistant layer on said polycrystalline silicon layer;
selectively etching said oxidation resistant layer, said polycrystalline silicon layer and said insulating layer in a pattern to define a plurality of conducting paths, said selective etching exposing the sidewalls of said first conducting layer;
selectively oxidizing the exposed sidewalls of said polycrystalline silicon layer, said selective oxidation perpendicular to the sidewalls of said polycrystalline silicon layer and subjacent to said oxidation resistant layer such that only a portion of said polycrystalline silicon layer is oxidized wherein the width of said polycrystalline silicon layer is reduced;
removing said oxidation resistant layer;
forming a conducting layer on said polycrystalline silicon layer, said conducting layer adhering only to the nonoxidized portion of said polycrystalline silicon layer wherein the nonoxidized portion of said polycrystalline silicon layer defines a template for a primary conductor path, said conducting layer having a higher conductivity than said polycrystalline silicon layer, wherein said conducting layer forms said primary conductor path; and
forming a protective layer over said conducting layer.

4,445,267

MOSFET STRUCTURE AND PROCESS TO FORM MICROMETER LONG SOURCE/DRAIN SPACING

Francisco H. De La Moneda, Tucson, Ariz., and Robert C. Dockerty, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,953
Int. Cl.[3] **H01L** *21/265, 21/28*
U.S. Cl. 29—571 **24 Claims**



1. A method for fabricating a semiconductor integrated circuit structure having at least some field effect transistor devices having a sub-micrometer gate length, comprising:
providing a semiconductor substrate;
forming a surface isolation pattern in said semiconductor substrate which isolates regions of said semiconductor within said substrate from one another and which regions are designated to contain devices;
forming a silicon dioxide layer which is designated to be in part the gate dielectric upon the surface of said substrate having the surface isolation pattern therein;
depositing a conductive layer upon said silicon dioxide layer;
depositing an insulating layer on said conductive layer;
depositing a first silicon nitride layer on said conductive layer;
depositing a doped polycrystalline silicon layer upon said silicon nitride layer;
depositing a second silicon nitride layer on said polycrystalline silicon layer;
selectively etching said second silicon nitride layer and said polycrystalline silicon layer so as to provide remaining portions of said polycrystalline silicon layer having substantially vertical sidewalls, wherein portions of said remaining portions extend across certain of said regions designated to contain devices and onto the surrounding isolation pattern;
thermally oxidizing each of said sidewalls to form a silicon dioxide sidewall layer thereon;
etching said remaining portions of said polycrystalline silicon layer and overlying second silicon nitride layer;
removing the undesired portions of said silicon dioxide sidewall layer;
using said sidewall layer as a mask, etch said first silicon nitride layer, and said conductive layer to form the gate electrode of said field effect transistor devices in said conductive layer having the length of said sidewall coating;
ion implanting a conductivity imparting impurity adjacent to said gate electrode to form a source/drain element for said field effect devices in said regions designated to contain devices; and
forming an insulation layer over said device with openings

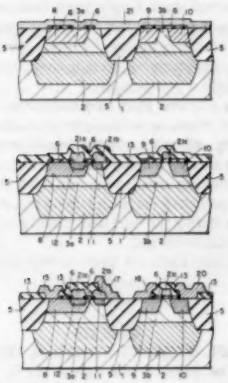
therein having electrical contacts to the various elements of said devices.

4,445,268

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT BI-MOS DEVICE

Tadashi Hirao, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,541
Claims priority, application Japan, Feb. 14, 1981, 56-20351; Mar. 5, 1981, 56-32981
Int. Cl.³ H01L *21/225, 21/76*
U.S. Cl. 29—571 5 Claims



1. A method of manufacturing a BI-MOS semiconductor integrated device, comprising:

masking an epitaxial layer of a silicon substrate;

selectively oxidizing said epitaxial layer to form a first oxide film whereby element formation regions are defined and electrically isolated from one another in a pattern as defined by said masking;

forming a second oxide film on said epitaxial layer;

masking said second oxide film;

diffusing impurity ions through said second oxide film, whereby a base layer, a source layer and a drain layer are formed of a first dopant type;

removing said second oxide film at predetermined points, whereby said predetermined points correspond with points where emitter and collector diffusion is to be completed;

forming a silicon film on said epitaxial layer of a second dopant type;

diffusing said silicon film into said element formation regions, such that both an emitter layer and a collector extending layer are formed of said second dopant type;

removing said silicon film at predetermined points, whereby the remaining film forms a gate electrode, a collector electrode, and an emitter electrode, of said second dopant type; and

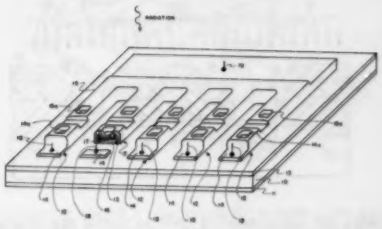
providing insulation and electrical contact means to electrically address the transistor elements.

4,445,269

METHODS OF MAKING INFRARED PHOTOCONDUCTORS WITH PASSIVATION CONTROL

John H. Pollard, Alexandria, Va., assignor to The United States of America as represented by the Scretary of the Army, Washington, D.C.

Filed Aug. 27, 1981, Ser. No. 296,751
Int. Cl.³ H01L *21/368, 21/28*
U.S. Cl. 29—572 2 Claims



1. A method of making an infrared detector from a semiconductor substrate doped slightly conductive, which method includes the following steps:

(a) prepare the substrate and coat one side thereof with an ohmic contact metal;

(b) deposit a layer of semiconductor photoconductor material on the opposite side of said substrate from said metal;

(c) mask the photoconductor layer;

(d) remove the unmasked portion of the photoconductor layer;

(e) remove the mask;

(f) deposit an overlayer of the same material as the substrate atop the bared substrate and the remaining photoconductive layer;

(g) mask the overlayer for detector ohmic contacts;

(h) remove the unmasked portions of the overlayer and a portion of the photoconductor layer to form cavities therein;

(i) deposit ohmic contact material atop the mask and onto the bottoms of said cavities;

(j) remove the mask and the contact material thereon;

(k) coat the overlayer and the surfaces of the cavities with a Schottky barrier metal;

(l) mask the metal;

(m) remove the unmasked portions of the metal whereby read contacts remain atop the overlayer and connect to the ohmic contacts in said cavities;

(n) remove the mask; and

(o) apply bonding leads to the read contacts.

4,445,270

LOW RESISTANCE CONTACT FOR HIGH DENSITY INTEGRATED CIRCUIT

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,782
Int. Cl.³ H01L *21/265;* B01J *17/00*
U.S. Cl. 29—576 B 7 Claims

1. A process for forming low resistance metal contacts for a high density integrated circuit, the integrated circuit having shallow drain and source regions of a first conductivity type formed in a semiconductor body of a second conductivity type, a first oxide layer formed directly on the semiconductor body over the drain and source regions and a second oxide layer formed on the first oxide layer, comprising the steps of:

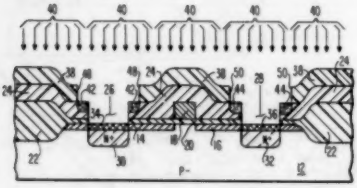
forming first contact openings through the first and second layers, the openings aligned with respect to the drain and source regions to expose contact areas thereon;

forming a layer of apertured masking material over the second oxide layer, the apertures of the masking material

being in corresponding registry with and larger than the corresponding contact openings in the first and second oxide layers;

implanting conductivity modifiers of the first conductivity type into both the exposed contact areas and into the unmasked regions of the second oxide layer surrounding the contact openings;

removing the layer of apertured masking material;



heating the semiconductor body to anneal any damage induced in the contact area and to flow the implanted unmasked regions of the second oxide layer surrounding the contact openings; and

forming metal lines on the second oxide layer in direct ohmic contact with the contact areas of the drain and source diffused regions.

4,445,271

CERAMIC CHIP CARRIER WITH REMOVABLE LEAD FRAME SUPPORT AND PREFORATED GROUND PAD

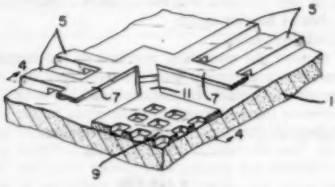
Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 14, 1981, Ser. No. 293,023

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.[3] **H01L** *23/50, 23/48;* **H05K** *5/02*

U.S. Cl. 29—589 **2 Claims**



1. A method of manufacturing a ceramic chip carrier comprising the steps of:

(a) providing a planar ceramic substrate;

(b) providing a planar copper-surfaced lead frame having a plurality of leads connected at the interior thereof by a copper-surfaced support rim coplanar with said lead frame, said rim being of a thickness less than said lead frame;

(c) providing a planar copper-surfaced ground pad within said support rim and connected thereto, said pad being coplanar with said lead frame, said pad having perforations therethrough;

(d) disposing said lead frame and said pad against said ceramic substrate with a layer of copper oxide at the interface, said rim being in non-contacting relation with said substrate;

(e) direct bonding said lead frame and padto said substrate.

4,445,272

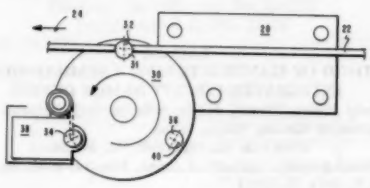
METHOD AND APPARATUS FOR STACKING ROTOR BLANKS ON A SHAFT

Peter H. Bruhn, Round Rock, and Rolf Wustrau, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 159,760, Jun. 16, 1980, abandoned. This application Nov. 2, 1982, Ser. No. 438,440

Int. Cl.[3] **H02K** *15/02*

U.S. Cl. 29—598 **8 Claims**



1. A method of manufacturing a uniform stepper motor rotor of a predetermined stack height from laminae with apparatus including a lamina punch for punching laminae from sheet stock strip, a rotatable carousel having a plurality of rotatable work stations each carrying a rotor shaft, and a work station punch, said method comprising:

(a) punching a lamina from said stock strip with said lamina punch and returning said lamina to said stock strip;

(b) advancing said stock strip to one of said work stations;

(c) punching said previously punched lamina from said stock strip and forcing said lamina onto said shaft;

(d) rotating said shaft for each lamina forced onto said shaft;

(e) repeating steps a through d until said predetermined stack height is achieved; and

(f) rotating said carousel upon completion of said rotor stack.

4,445,273

DISPLACEMENT CONTROL DEVICE

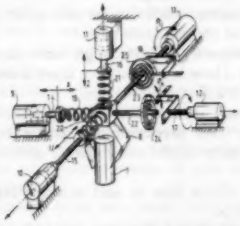
Hendrik M. Van Brussel, and Joseph A. G. Simons, both of Leuven, Belgium, assignors to Leuven Research and Development V.Z.W., Leuven, Belgium

Continuation of Ser. No. 128,586, Mar. 10, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,835

Claims priority, application Netherlands, Mar. 12, 1979, 7901956

Int. Cl.[3] **B23Q** *7/00*

U.S. Cl. 29—714 **1 Claim**



1. An automatic assembly control apparatus comprising body means for holding an object which is to be moved relatively along one axis into assembled relation to another object; first means for resisting motion of said body means along said one axis to define one degree of freedom of said body means and to provide compliance along said one axis; second means for resisting motion of said body means to define a second

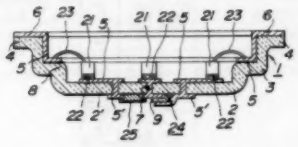
degree of freedom thereof and to provide compliance in said second degree of freedom; first force measuring means for providing a first output signal proportional to motion of said body means along said one axis which is due to misalignment of said objects as they are being assembled; second force measuring means for providing a second output signal proportional to deformation of said second means which is due to motion of said body means in said second degree of freedom which is due to misalignment of said objects as they are being assembled; first actuator means for moving said body means along said one axis and second actuator means for effecting movement of said body means in said second degree of freedom thereof; first feedback means responsive to selected values of said first output signal for causing said first actuator means to move said body means selected distances along said one axis in that direction which decreases said first output signal and second feedback means responsive to a selected values of said second output signal for causing said second actuator means to move said body means selected amounts in the path of said second degree of freedom in that direction which decreases said second output signal and each feedback means being effective to selectively vary the compliance of the respective first and second means.

4,445,274

METHOD OF MANUFACTURING A CERAMIC STRUCTURAL BODY

Go Suzuki, Nagoya, and Kazuo Michishita, Fujiyoshida, both of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 970,444, Dec. 18, 1978, abandoned. This application May 21, 1981, Ser. No. 265,848
Claims priority, application Japan, Dec. 23, 1977, 52-174414
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—832 **8 Claims**



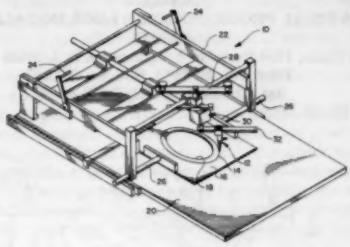
1. A method of manufacturing a ceramic structural body comprising:
   - preparing a ceramic green sheet of substantially uniform thickness;
   - forming at least one through-hole through the thickness of the ceramic green sheet;
   - filling the through-hole with electrically conductive material;
   - selectively coating a surface of said ceramic green sheet with metallizing paste to achieve a desired pattern of print layers;
   - press-forming the coated ceramic green sheet to form a substantially concave-convex green ceramic member having
     - a plate portion,
     - a sidewall portion extending from said plate portion at substantially right angles thereof,
     - a flange portion extending from the free end of said sidewall portion at substantially right angles thereto,
   - wherein said print layers are on the concave side of said green ceramic member;
   - sintering said green ceramic member;
   - treating said sintering ceramic member to form electrically conductive metal layers from at least part of said print layers;
   - mounting at least one electronic component on said sintered ceramic member; and
   - electrically connecting said electronic component to said metal layers.

4,445,275

DRAWING ASSEMBLY

David Dubrow, 4018 Cedarbrook Ct., Bellingham, Wash. 98225

Filed Jun. 7, 1982, Ser. No. 386,009
Int. Cl.³ B43L *11/04*
U.S. Cl. 33—30 R **14 Claims**



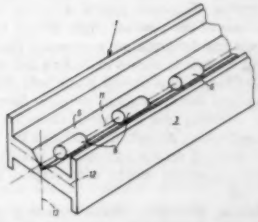
1. A drawing assembly configured for outlining the margin of a mat having a generally elliptical-shaped cut therein in a pattern replicating that of said cut, adapted for attachment to the mat cutting apparatus employed to make said cut, said drawing assembly comprising:
   - a. carriage slide means for adjustably securing a pen member at a selected location in cooperative engagement on a guide arm of a mat cutting apparatus;
   - b. a pen member, including a reservoir and a nib, received in a stem means for outlining a cut formed in a mat board by said mat cutting apparatus;
   - c. pen holder means depending from said slide means receiving said pen member in axially reciprocable engagement therewith, said pen member being reciprocable between a lowered operating position and a raised non-operating position;
   - d. biasing means for biasing said pen member toward said operating position; and,
   - e. locating means in operative engagement with said carriage slide means, for guiding said nib when said pen member is in said operating position and said guide arm of said mat cutting apparatus is set in motion along a path replicating said outline.

4,445,276

STEPPED END-GAUGE BLOCK APPARATUS

Geza Vöneky, Stuttgart, and Hans H. Schüssler, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1983, Ser. No. 495,942
Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219713
Int. Cl.³ G01C *25/00*
U.S. Cl. 33—168 R **18 Claims**



1. Crenellated stepped end-gauge apparatus with an elongate supporting body and a plurality of end-gauge blocks which are secured, spaced by defined distances, along a straight line,

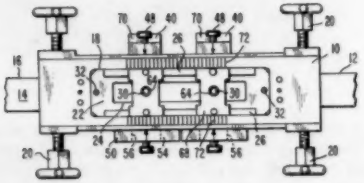
wherein the supporting body possesses a groove on its upper surface which runs longitudinally, the end-gauge blocks, which are preferably designed in the form of cylinders, being individually secured one behind another on the flanks of this groove.

4,445,277

UNIVERSAL PROGRAMMABLE LOCK INSTALLATION DEVICE

John Keefe, 1324 Parkside Ave., Trenton, N.J. 08638

Filed Oct. 29, 1982, Ser. No. 437,593
Int. Cl.³ B27G *17/08*; B23B *41/00*
U.S. Cl. 33—197 **13 Claims**



1. A universal programmable lock installation device, for use on doors, comprising:

(a) a body member positionable extending around the edge of the door and inwardly therefrom along each door face, said body member defining an aperture therein adjacent the door edge;

(b) a clamping means movably mounted within said body member to selectively secure said body member with respect to a door edge;

(c) a boring template selectively positionably mounted within said aperture and defining a boring slot therein, said boring template including guide rail means extending longitudinally along said boring slot;

(d) an edge boring alignment means movably secured with respect to said guide rail means to move longitudinally along said boring slot, said edge boring alignment means including edge boring guide hole means adapted to receive a boring tool therethrough for alignment through said boring slot of said boring template to bore out a section of a door edge to a desired depth;

(e) a first locking means adapted to fixedly secure said edge boring alignment means with respect to said body member;

(f) a securement means for selectively retaining said boring template within said aperture of said body member;

(g) a routing template selectively positionable within said aperture of said body member and adapted to be retained therein by said securement means, said routing template defining a routing slot therein to allow routing of the door edge to facilitate placement of a conventional lock face plate therein, the outer surface of said routing template providing a smooth surface to facilitate routing;

(h) a face boring alignment means movably secured with respect to one of the vertical edges of said body member to allow vertical longitudinal movement therealong, said face boring alignment means extending out over the door face and defining a face boring guide hole means oriented perpendicularly with respect to the door face and adapted to receive a boring tool extending therethrough to cut a face hole extending completely through the door;

(i) a second locking means adapted to fixedly secure said face boring alignment means with respect to said body member; and

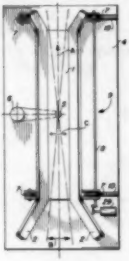
(j) a face boring abutment means movably secured with respect to the opposite vertical edge of said body member from said face boring alignment means and being vertically movable along the opposite vertical edge, said face boring abutment means extending out over the opposite side door face and defining an abutment block means defining an abutment aperture slightly larger than the face hole bored through the door by the cutting means extending through said face boring alignment means, said block means being in abutting engagement with respect to the opposite door face surrounding the face hole to prevent splintering of the opposite door face upon boring of the face hole.

4,445,278

WHEEL ALIGNMENT MEASURING APPARATUS, MORE SPECIALLY FOR DYNAMIC OPERATION

Alfons Staudinger, Munich, Fed. Rep. of Germany, assignor to A. Rohe GmbH, Nordring, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,310
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126152
Int. Cl.³ G01B *5/255*
U.S. Cl. 33—203.12 **16 Claims**



1. A wheel alignment measuring apparatus for dynamically measuring the track of vehicle wheels comprising:

(a) a first wheel channel having two open ends so that a vehicle wheel may be rolled therethrough;

(b) a second wheel channel being spaced from said first wheel channel at a distance corresponding to the track of the vehicle for taking up two wheels on an axle of the vehicle whose wheel alignment is to be tested;

(c) the first and second wheel channel having a length equal to at least between half and the full circumference of a wheel to be tested and being designed to engage the side faces of a tire on said wheels, wherein;

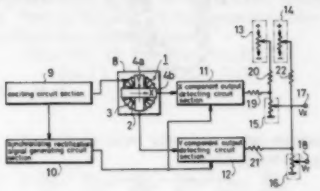
(d) one of said channels being supported on bearings so that it may be turned in a horizontal plane and cooperable with an angle transducer operably connected to the channel for sensing the angle in which the channel is oriented with respect to a reference line and wherein;

(e) at least one of said wheel channels being guided for motion parallel to itself and in a direction normal to the direction of rolling motion of a wheel along said channel by means of four support wheels having axes of turning parallel to said direction of wheel rolling, at least two of said support wheels having a common bearing shaft which shaft has the lowest degree of torsional stiffness necessary to keep motion of said channel parallel to itself when said channel is acted upon by a force at one end thereof.

4,445,279
MAGNETIC COURSE DETECTOR

Noboru Tsushima, Morioka; Masashi Fuse, Tamayama; Toshio Sasaki, Yokohama; Masayuki Ogata, Yokohama; Teruo Mimori, Yokohama, and Tadashi Mukai, Tokyo, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 13, 1982, Ser. No. 408,000
Claims priority, application Japan, Aug. 13, 1981, 56-127582
Int. Cl.³ G01C *17/38*
U.S. Cl. 33—356 10 Claims

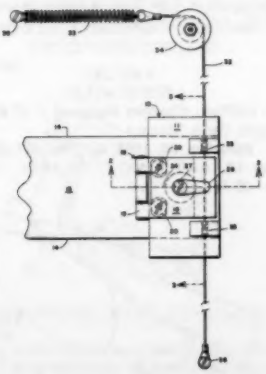


1. A magnetic course detector for detecting the bearing of the course of a traveling body, comprising: a magnetic bearing sensor mounted in the traveling body and adapted to detect the direction of terrestial magnetism and generate output voltages V_x, V_y proportional to the magnetic field intensity; an offset correcting means adapted to apply a bias to the said outputs of the magnetic bearing sensor so that the biased outputs V'_x and V'_y are $V'_x = V_x - O'_x$ and $V'_y = V_y - O'_x$ where O'_x and O'_y are respective offset correction components determined in a calibration mode for the magnetic course detector; a sensitivity correcting means adapted to regulate the output levels of the magnetic bearing sensor so that the absolute values of the biased outputs V'_x and V'_y are equal in all directions; and a sensor rotating means adapted for rotation of the magnetic bearing sensor such that the magnetic sensor coincides with the direction of the highest magnetic permeability of the traveling body.

4,445,280
BRAKE FOR DRAFTING PARALLEL

Jess W. Hayes, 9208 Farmington Dr., Richmond, Va. 23229

Filed Sep. 30, 1982, Ser. No. 431,208
Int. Cl.³ B43L *5/00, 13/00*
U.S. Cl. 33—443 5 Claims



1. A brake assembly for use with a drafting parallel resting on an inclined drafting table comprising:

(a) a base member of substantially rectangular outer perimeter having a flat upper surface and an underside having a flat central region bounded by straight parallel retainer shoulders extending below said flat region and adapted to engage the straight edges of said drafting parallel,

(b) an arm, one extremity of which is attached to the upper surface of said base member in a manner to permit motion of said arm in an arc perpendicular to said base member, the free end of said arm being adapted to apply downward force upon said base member,

(c) a resilient pad affixed to the underside of said arm adjacent the free end thereof,

(d) holding means adapted to retain said arm in a position downwardly forced upon said base member,

(e) a pair of guides secured to the upper surface of said base member in coaxial alignment and disposed on either side of said arm in linear alignment with said resilient pad,

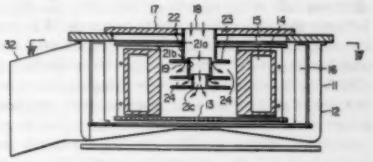
(f) a strong thin substantially non-elongated strand, one end of which is adapted to be secured to said table, the opposite end being joined to a coil spring adapted to be secured to said table, said strand passing through said pair of guides,

(g) whereby, when the flat underside of the base member is attached to the extremity of said drafting parallel, and said strand is affixed to said table to form a taut straight line passing through said guides, downward movement of said arm and retention thereof by said holding means causes said strand to be gripped between said resilient pad and the upper surface of said base member, thereby preventing movement of said drafting parallel.

4,445,281
DEHYDRATING DRIER

Seiichiro Aigoo, 15-13, Negishi 3-chome, Taito-ku, Tokyo 110, Japan

PCT No. PCT/JP81/00094, 371 Date Dec. 18, 1981, 102(e) Date Dec. 18, 1981
PCT Filed Apr. 21, 1981, Ser. No. 339,521
Claims priority, application Japan, Apr. 23, 1980, 55-52992; Jul. 30, 1980, 55-103639
Int. Cl.³ F26B *11/18*
U.S. Cl. 34—58 11 Claims



1. A dehydrating drier, comprising

a housing,

a plurality of water drop reflection preventing blades disposed in said housing,

means comprising a rotor rotatably mounted in said housing at a position inside of said blades for supporting a plurality of thin form objects and for producing a negative pressure upon rotation,

said rotor forms a ventilation channel communicating from an outside of said housing and said thin form objects and adapted for passage therethrough of a flow of drying gas from the outside to said thin form objects by said negative pressure produced upon rotation of said rotor,

deflectors disposed in said ventilation channel, each of said deflectors comprises a cylindrical portion disposed in an upstream direction of said ventilation channel and a flange portion in a downstream direction of said ventilation channel with respect to said flow of said drying gas, and

anti-static electricity means for generating a corona discharge into said ventilation channel and producing ions splattering into the flow of said drying gas, said anti-static electricity means is disposed on said flange portions of said deflectors.

4,445,282

COOLER FOR GRANULAR PRODUCTS

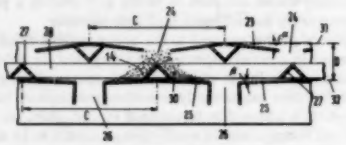
Henricus T. J. M. Heinemans, Narcisstraat 11, 6014 AK Ittervoort, Netherlands

Filed Oct. 21, 1981, Ser. No. 313,243

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1981, 3139773

Int. Cl.³ F26B *17/14*

U.S. Cl. 34—168 **5 Claims**



1. A cooler for granular products, especially feed pellets and the like, including a mass of granules and fines, the mass of granules moving between a product inlet and a product outlet, comprising a cooling reservoir, at the same time being a storage hopper, a discharge grid for the discharge of the mass of granules, said discharge grid including a stationary grid and a movable grid, and a blower for generating an air current, characterized in that said movable grid is disposed above said stationary grid, and the air inlet **(13)** for the blower terminates in the top part of the cooling reservoir **(5)** adjacent the product inlet, which is formed as a granule inlet lock **(2)**, the arrangement being such that the cooling air is drawn in through the discharge grid **(7)** and flows in a direction opposite to the direction of movement of the mass of granules **(14)** in the reservoir **(5)**, the fines in the incoming mass of granules being directly exhausted by the blower, said movable grid **(22)** is of double construction and consists of two virtually parallel, spaced grid surfaces **(31,32)** built up from substantially horizontally extending elements **(23,25)** spaced uniform distances **(24,26)** apart, the elements **(23)** of the first grid surface **(31)** being offset by half the pitch distance (C) relatively to the elements **(25)** of the second grid surface **(32)**, the distance (D) between the grid surfaces, the interspaces **(24,26)** between, and the width of elements **(23,25)** being so selected that the material discharged through openings **(24)** in the first grid surface **(31)** from the reservoir can keep lying on the elements **(25)** of the second grid surface **(32)**, said stationary grid being disposed between the two grid surfaces of said movable grid **(22)** and comprising elements **(27)** extending vertically to said grid surfaces **(31,32)**, the pitch distance (C) of said elements **(27)** being equal to the pitch distance of said substantially horizontally extending elements **(23,25)** of said double grid **(22)**.

4,445,283

FOOTWEAR SOLE MEMBER

Stuart R. Meyers, Bronx, N.Y., assignor to Synapco Ltd., Bronx, N.Y.

Division of Ser. No. 970,010, Dec. 18, 1978, Pat. No. 4,297,797. This application Oct. 10, 1980, Ser. No. 196,020

Int. Cl.³ A43B *13/20*

U.S. Cl. 36—29 **6 Claims**

1. A footwear sole member formed essentially of material containing a plurality of compressible fluid-filled chambers and comprising toe, metatarsal head, remaining lateral and remaining medial portions, said toe, metatarsal head and remaining

lateral portions being generally more compressible than said remaining medial portion.

4,445,284

FOOTWEAR WITH INTEGRAL CUSHIONING AND VENTILATING APPARATUS

Eric M. Sakutori, 381 Waiehu Beach Rd., Wailuku, Hi. 96793

Filed Feb. 18, 1982, Ser. No. 350,082

Int. Cl.³ A43B *7/08, 7/06, 13/20*

U.S. Cl. 36—3 B **2 Claims**

2. A shoe which comprises:

an upper;

a sole having a plurality of elongated chambers disposed therein, each chamber communicating with at least the top face of the sole and the ambient surrounding the shoe;

a first check valve disposed substantially at the first axial extremity of each of said elongated chambers to limit the direction of flow in the elongated chamber in which it is disposed to a first direction; and

a second check valve in each of said elongated chambers substantially at a second axial extremity of and which is oriented to allow fluid flow in a direction which is opposite to said first direction.

4,445,285

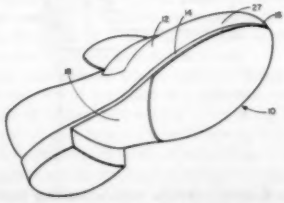
SHOE SOLE

Donald W. Phillips, Chateau Perigood 1 45 D, L Aceto St. Leon, Monte Carlo, Monaco

Filed Sep. 30, 1981, Ser. No. 307,250

Int. Cl.³ A43B *13/00, 13/04, 19/00, 13/22*

U.S. Cl. 36—25 R **15 Claims**



1. A wear portion for use in repairing a shoe having a toe portion, a waist portion and an existing sole with a ground engaging surface, comprising:

wear means having substantially convex upper and lower surfaces;

the wear means extending in an operative position thereof from the toe portion to a point at the beginning of the waist portion of the shoe; and

the upper surface of the wear means being attachable to the ground engaging surface of the shoe in said operative position so that the lower surface engages the ground.

4,445,286

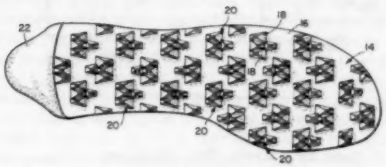
FOOTWEAR, SUCH AS ATHLETIC SHOE

Edward J. Norton, Kingston, N.H., assignor to New Balance Athletic Shoe, Inc., Boston, Mass.

Filed Oct. 19, 1981, Ser. No. 312,756

Int. Cl.³ A43B *13/04, 23/28*

U.S. Cl. 36—32 R **7 Claims**



1. Footwear of the type adapted for field sports, such as football, baseball, softball and the like comprising a sole portion, an upper portion attached to said sole portion providing a foot receiving opening, and wherein said sole portion is characterized by a plurality of raised elements integral with said sole portion extending from a base within substantially the plane of the outer surface of said sole portion, a substantial majority of said raised elements located in individual groups of interlocking raised elements in substantially mutually perpendicular orientation and spaced from other groups of interlocking raised elements within the area of said outer surface, said sole portion further characterized by being formed of a material capable of flexure during each step and repeated cycles of foot movement whereby collected debris between individual groups of raised elements and between said interlocking raised elements of each said group may release and separate from said sole portion.

4,445,287

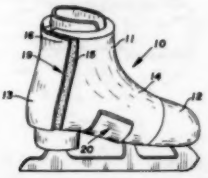
SKATE BOOT COVER

Mario C. Garcia, 1167 Ottawa Ave., West St. Paul, Minn. 55118

Filed Jul. 6, 1982, Ser. No. 395,489

Int. Cl.³ A43B *3/18, 5/00*

U.S. Cl. 36—106 **2 Claims**



1. A releasably attachable insulative covering for a skat shoe and comprising:

(a) covering means adapted to envelop the skate shoe and fabricated from thermally insulative material and including a toe covering portion, a heel covering portion, and an in-step covering portion, including right and left lateral covering panels, and flexible fastening means for releasably attaching the covering panel to the skate shoe;

(b) said heel covering portion being formed of adjoining extension panels from said right and left lateral covering portions; and

(c) said flexible fastening means including a plurality of individual mating pairs of fasteners, each pair including a hook fastener portion and a loop fastener portion, with each of said fastener portions being mounted on said covering panel means, and with one of each such mating pairs of fasteners being secured generally vertically along each of said lateral covering portions to form a heel closure, and with one such mating pair being secured generally medially along said right and left lateral covering portions to form a cross-strap tab fastener extending generally transversely across and beneath the underside of the arc portion of the skate shoe.

4,445,288

SPORT SHOE WITH A STUDDED SOLE

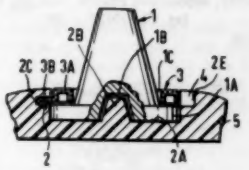
Werner Frör, Schornbaumstrasse 5, D-8520 Erlangen, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,949

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112390

Int. Cl.³ A43C *13/04, 15/16*

U.S. Cl. 36—134 **12 Claims**



1. In a short shoe having a sole with at least one pocket therein, a stud with a stud body in the form of an outward ground-gripping part, said stud being fixed to said sole by having a root part thereof infixed in said pocket, said root part having outward locking parts thereon to be overlapped by inward locking parts on an edge of said pocket, the invention residing in that said stud root is made up in two pieces, a base plate and a non-compressible, rigid keeper washer slipped onto said stud body and resting against a side of said base plate facing said stud body, said keeper washer having said outward locking parts thereon, which are taken up in grooves running next to said inward locking parts in a wall of said pocket, said keeper washer being designed for use with a key for turning its outward locking parts between a turned-home locked position, wherein they are locked and infixed by being overlapped by said inward locking parts, and a freed, uncovered position freeing said stud's base plate to take said stud out of said pocket.

4,445,289

PLASTIC SPIKE FOR SPORTS SHOE

Charles Benéteau, Pouzauges, France, assignor to Patrick S.A., France

Filed Jun. 7, 1982, Ser. No. 385,797

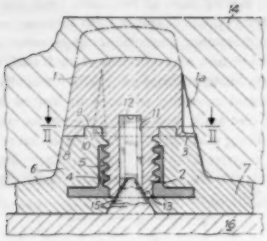
Claims priority, application France, Jun. 23, 1981, 81 12329

Int. Cl.³ A43C *15/16*

U.S. Cl. 36—134 **3 Claims**

1. A spike, preferably made entirely of plastic material, for a sport shoe having securing means in the sole thereof, which spike comprises a head portion, means carried by the head portion for rotating the head portion to lock same onto the securing means, a threaded stem extending from the head portion for engagement within the securing means, and the threaded stem being provided with a blind axial conduit having

a blind end and a free end, the axial conduit being of a polygonal cross-sectional configuration for engagement by a spanner



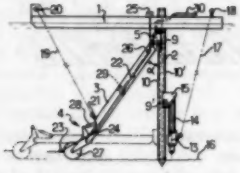
of corresponding configuration upon breakage of the spike and exposure of the blind end.

4,445,290

APPLIANCE FOR DREDGING THE BOTTOM OF A BODY OF WATER

Jacques Oules, Paris, France, assignor to Hydroconsult, S.A., France

Filed Dec. 14, 1981, Ser. No. 330,788
Claims priority, application France, Dec. 16, 1980, 80 26683
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—66 **14 Claims**



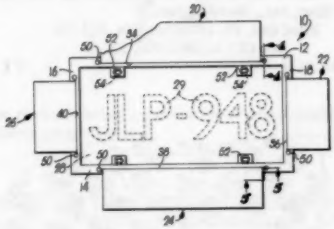
1. Dredging appliance, particularly for dredging at great water depths of up to 100 meters and more, comprising: a buoyant body adapted to float on the water surface; an anchoring device vertically movably mounted in said buoyant body between an anchoring position wherein its lower end is driven into the water bottom and a raised position withdrawn from said bottom; a first support carriage supporting a working head carrying arm, said first carriage being slidably mounted on said anchoring device for vertical movement on said anchoring device; a working head carrying arm hingedly mounted at one of its ends on said first support carriage so as to be rotatable about a substantially horizontal axis, said working head carrying arm having a constant length; a working head carried by the other free end of said arm, said working head being adapted to dredge said bottom by accomplishing successive parallel dredging movements, each movement being along a path in a form of an arc of circle; and control cables for moving said working head along each said dredging path; said first support carriage being vertically slidable along said anchoring device between an upper dredging position wherein the length of said working head carrying arm is such that said working head is in contact with said bottom with said working head carrying arm forming a relatively small angle with the vertical axis of said anchoring device, and a lower dredging position where said arm extends substantially horizontally, with said anchoring device remaining in its anchoring position driven in the water bottom and said working head being in contact with said bottom, said working head being movable in a direction perpendicular to the dredging paths by the vertical movement of said first carriage on said anchoring device from said upper dredging position to said lower dredging position corresponding thereby to a multitude of parallel dredging paths.

4,445,291

LICENSE PLATE FRAME WITH DETACHABLE DISPLAY PANELS

Robert E. Easley, 5704 Woodland, Kansas City, Mo. 64110

Filed Jan. 24, 1983, Ser. No. 460,155
Int. Cl.³ G09F *7/00*
U.S. Cl. 40—210 **2 Claims**



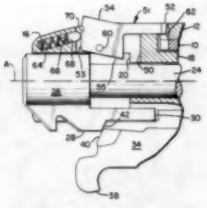
1. A frame for a license plate comprising:
an upper member and spaced apart lower member,
a pair of spaced apart side members interconnecting said upper and lower members,
at least one of said members including structure defining an elongated slot therein;
a display panel detachably received within said slot, said display panel having a display portion and a retaining portion, there being tabs on said retaining portion; and
means for releasably retaining said retaining portion within said slot, said retaining means including set screws threadably received within said slot for engaging said tabs and thereby removably positioning said retaining portion within said slot.

4,445,292

BOLT LATCH FOR BOLT-ACTION FIREARM

Fred E. Martin, Frankfort, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 290,693, Aug. 6, 1981. This application Jul. 7, 1983, Ser. No. 511,449
Int. Cl.³ F41C *11/06*
U.S. Cl. 42—16 **7 Claims**



1. In a bolt-action firearm of the type having a substantially cylindrical bolt rotatably mounted for movement between open and closed positions; a bolt plug non-rotatably mounted and having threaded connection with said bolt; a firing pin mounted reciprocably in said bolt plug for movement between fired and cocked positions with respect to said bolt; the improved bolt latch mechanism which comprises;
a latch lever having a tooth; said bolt plug being formed with a recess receiving said latch lever; said bolt being

formed with a locking notch opening onto an outer peripheral surface thereof at a location radially aligned with said tooth upon rotation of said bolt to said closed position; means mounting said latch lever in said recess for pivotal movement about an axis substantially perpendicular to the longitudinal axis of said cylindrical bolt between a first, latched position in which said tooth is engaged in said locking notch to latch said bolt against rotation with respect to said bolt plug, and a second, unlatched position in which said tooth is disengaged from said locking notch to release said bolt for rotation; spring-biased plunger means mounted in said bolt plug for biasing said latch lever toward said first position;

said latch lever having cam means arranged to project, upon pivotal movement of said latch lever into said first position, into the path of reciprocation of said firing pin, whereby movement of said firing pin to said fired position normally pivots said latch lever from said first to said second position to unlatch said bolt, and movement of said firing pin to said cocked position normally permits said spring-biased plunger means to pivot said latch lever from said second to said first position to latch said bolt;

said latch lever having a detent notch, and being manually pivotable in said recess to a third, disabled position in which said cam means is withdrawn from the path of reciprocation of said firing pin, said tooth is released from said locking notch and said detent notch engages said plunger means to interfere with rotation of said latch lever from said third position, and thereby render said plunger means inoperative to pivot said latch lever toward said first position thereof.

4,445,293

FOLDING GUIDE ASSEMBLY

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan

Filed Sep. 23, 1981, Ser. No. 305,042
Claims priority, application Japan, Oct. 14, 1980, 55-144074
Int. Cl.³ A01K *87/04*
U.S. Cl. 43—24 **5 Claims**

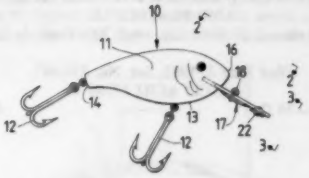
1. An improved folding line guide assembly for a fishing rod, said guide assembly comprising a guide ring, a pair of rear supporting legs and at least one front supporting leg depending from the guide ring, said rear and front legs being resiliently separable from each other at the lower ends thereof, and a mounting member having a guide slot for slidably receiving the lower end of said front supporting leg, said rear supporting legs being pivotally received in a pivot hole in the mounting member while said at least one front supporting leg is slidably fitted at its lower end in the guide slot of the mounting member.

4,445,294

FISHING LURE HAVING A PADDLE-LIKE MEMBER

James R. Gowing, Altus, Ark., assignor to EBSCO Industries, Inc., Birmingham, Ala.

Filed Sep. 13, 1982, Ser. No. 417,032
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.47 **5 Claims**



1. In a fishing lure having a generally planar, paddle-like member extending forwardly from the front end portion of the body of the fishing lure, the improvement comprising,

(a) there being at least one transverse, outwardly opening cavity in the front end portion of said paddle-like member and being generally round, as viewed in cross section,

(b) a weight of a size to be inserted into said cavity with a friction fit, and

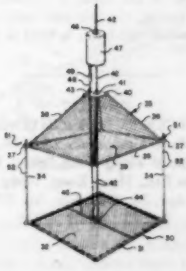
(c) said cavity being positioned in said paddle-like member at a location so that upon insertion of said weight into said cavity the center of gravity of said lure is lowered to stabilize movement of the lure and control the rate and angle of descent of said lure as it moves through the water.

4,445,295

MARINE LIFE TRAPS

Biagio Litrico, P.O. Box 742, Fernandina Beach, Fla. 32034

Filed Nov. 15, 1982, Ser. No. 441,399
Int. Cl.³ A01K *71/00*
U.S. Cl. 43—102 **12 Claims**



1. A trap for catching marine life species which may be baited comprising a bottom planar member, vertical guide means attached to said bottom planar member, a top enclosure means slidably guided on said vertical guide means between a closed position in contact with the bottom planar member to an open position spaced from and above the bottom planar member, stop means limiting the open position of the enclosure means, buoyancy means spaced from the enclosure means, connecting means between the buoyancy means and enclosure means whereby the buoyancy means normally maintains the enclosure means in the open position in a water environment, a timed disengageable link means intermediate the ends of said connector means releasing at least a part of said buoyancy means from the enclosure means whereby the enclosure means is free to fall downwardly onto the bottom planar member

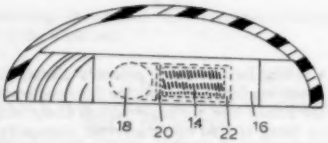
after a pre-selected time of immersion and lifting means connecting the bottom planar member and the enclosure means whereby the enclosure means may be moved to the closed position and held in the closed position and the trap and contents lifted whether the timed link has disengaged or not.

4,445,296

SPRING POWERED SAUCER WITH LAUNCHING TAB AND PLATFORM

James A. Lehman, 59 Reid Ter. (Apt. 14), Fond du Lac, Wis. 54935

Filed May 3, 1982, Ser. No. 374,007
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—74 D **6 Claims**



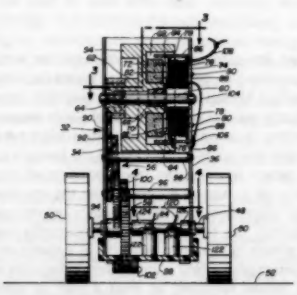
1. A toy flying saucer, comprising:
a. a central body portion having a curvi-linear air foil configured depending lip positioned around the periphery of said body portion, the lip having a chamber positioned perpendicular to the radius of the saucer;
b. a spring positioned in said lip chamber perpendicular to the radius of the saucer;
c. a compression member to be held in the hand and to be associated with said saucer body to compress a spring, said member being separate from said body;
d. latching means secured to said member and engaging the wall of said body at the rear end thereof for holding said member partly within said body to compress said spring;
e. said latching means having a resilient part laying outside said body and extending freely toward said body to be operated by manual pressure applied thereto when said member is held in the hand to release said body to the action of said spring, to cause said body to withdraw from said member while the latter is held in the hand as aforesaid.

4,445,297

TOY MOTORCYCLE WITH LIGHTING MECHANISM

Bruce M. D'Andrade, Whitehouse Station, N.J.; Ping F. Ng, a...l Tak M. Ma, both of Hong Kong, Hong Kong, assignors to ARCO Industries Ltd., Hong Kong, Hong Kong

Filed Apr. 30, 1982, Ser. No. 373,421
Int. Cl.³ A63H *17/28*
U.S. Cl. 46—230 **5 Claims**



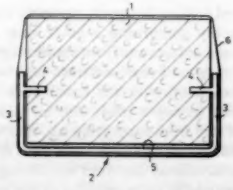
1. A toy motorcycle having at least one electric light bulb mounted thereon and comprising in combination an elongated frame having front and rear portions extending from a central enclosure and comprising complementary side plates shaped to form said enclosure, front and rear wheels supported by said front and rear portions of said frame for free rotation, a metal housing supported within said enclosure and containing: a gear train comprising interengaging gears supported upon shafts extending transversely through bearings in opposite side plates of said housing, a drive shaft extending through bearings in the lower portions of said side plates of said housing at opposite sides of said central enclosure and a pair of drive wheels having friction rims supported respectively upon opposite ends of said drive shaft and dispersed outwardly of the opposite sides of said side plates of said central enclosure and the rims of the wheels being in a plane slightly below a parallel plane engaging the lowest portions of said front and rear wheels, whereby said drive wheels can engage a supporting surface to prevent any appreciable side tilting of the motorcycle when all of said wheels engage said surface, said drive wheels also being rotatable by engagement with said surface when the motorcycle is pushed manually therealong, an inertia flywheel mounted upon a transverse shaft in said housing, electric generating means comprising an electric armature coaxially fixed to said flywheel for rotation therewith, an electric field coil and stator unit supported by one side of said metal housing coaxially with said armature, said stator comprises finger-like pole pieces spaced circumferentially around the perimeter of said armature and projecting laterally from one face of a wire field coil, half of said pole pieces comprise the outer ends of said fingers bent perpendicularly from radial fingers within a plane adjacent one side of said field coil and the other half of said pole pieces comprise fingers stamped from the metal side plate of the housing which supports said field coil and are bent perpendicularly to the plane of said side plate and interspersed between the first half of said pole pieces to form a circular pattern thereof surrounding the periphery of said electric armature, an electric circuit extending from one end of said coil and connected to said metal housing to serve as a ground and said circuit also extending from the other end of said coil to said electric light bulb, gears of said train respectively on said drive shaft and said transverse shaft of said armature, and intermediate gears mounted between and meshing with said aforementioned gears of said train operable to multiply the speed of said armature and inertia wheel relative to said drive shaft, whereby as the drive shaft is operated by said inertia wheel to propel the motorcycle forwardly by rotation of said drive wheels the armature and stator generate electric current to illuminate the electric light bulb through a circuit extending from said stator.

4,445,298

BASE FOR INSERTING FLOWERS, TWIGS AND SIMILAR ITEMS

Manfred Roder, Frankenthal, Fed. Rep. of Germany, assignor to Smithers Oassis GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,748
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 8026097[U]
Int. Cl.³ A47G *7/02, 7/00*
U.S. Cl. 47—41.12 **2 Claims**



1. A base for the insertion of flowers, twigs, fruits and similar

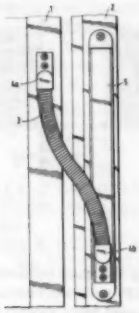
items, consisting of a mass of a plastic foam which is rigidly connected to a support of suitable material characterized in that the support is of trough-shape, into which is placed the plastic foam, a plastic foil surrounds all of the support and plastic foam, and is attached thereto by a shrink fit and said foil being provided with holes which are distributed generally over its surface, allowing wetting of the foam while impeding evaporation therefrom.

4,445,299

ARRANGEMENT IN DOORS

Keijo Lehikoinen, and Kyösti Nevalainen, both of Joensuu, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Feb. 19, 1981, Ser. No. 236,122
Claims priority, application Finland, Feb. 20, 1980, 800497
Int. Cl.³ B60J *1/08, 13/00*
U.S. Cl. 49—167 **10 Claims**



1. An arrangement for obtaining an uninterrupted connection of an electric cable or the like between two elements pivotally hinged to each other, in particular, between a door frame element and a door connected thereto, said arrangement comprising:

at the position of the connection, a single hollow member arranged to enclose said cable in the form of a separate, turnable and longitudinally flexible protecting element, said element being arranged basically in the longitudinal direction of said door frame element;

a first connection element for connecting one end of said hollow member to said door frame element;

a second connection element for connecting the other end of said hollow member to an adjacent edge part of said door;

at least one recess in said door frame element and/or in said door edge part for said single hollow member, said first connection element and said second connection element, said at least one recess being so arranged that, when said door is closed, said protecting element and said cable are received in said recess; and said first and second connection elements each including:

a ball joint element having an enclosed passageway for the cable forming a continuous passageway with said single hollow member; and

said ball joint elements permitting said single hollow member to be swung and turned relative to said first and said second connection elements.

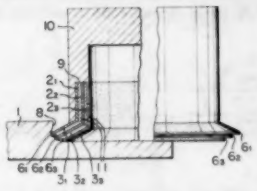
4,445,300

METHOD FOR GRINDING FLAT PLATES

Shinji Sekiya, Tokyo, and Takatoshi Ono, Nagareyama, both of Japan, assignors to Disco Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1980, Ser. No. 212,669
Claims priority, application Japan, Feb. 1, 1980, 55-10887
Int. Cl.³ B24B *7/20*
U.S. Cl. 51—283 R **2 Claims**

1. In an improved method for grinding flat plates by rotating at high speed a grinding wheel attached to the open end of an inverted cup, comprising providing a thin grinding wheel of super hard crystalline material comprising a thin circumferential skirt of uniform thickness projecting outward aslant from the open end of the cup at an angle in the range of about 10 to 45 degrees to the work surface being ground, bringing the peripheral edge of said thin skirt into contact with the work, undercutting the work with the skirt peripheral edge in a direction transverse to the thickness of the work, and causing the undercut portion of the work to disrupt by itself, wherein



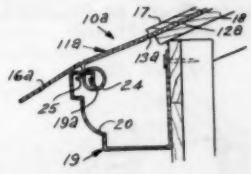
the improvement comprises providing the open end of the inverted cup with a multiplicity of said thin skirts with the edge thicknesses of the skirt being held constant in the range of about 0.1 mm to 0.5 mm thickness, and including spacing the respective thin skirts of said wheel one above another along the cup axis in partly overlapping relation so that a given skirt is supported radially outward of the cup from beneath by the skirt directly beneath it, said undercutting of the work occurs above the upper one of the skirts, and only the thin peripheral edge of each skirt is brought into contact with the work.

4,445,301

ROOF AND GUTTER SAVING DEVICE

James A. Tanski, 8621 Lochdale, Dearborn Heights, Mich. 48127

Filed Jul. 13, 1982, Ser. No. 397,844
Int. Cl.³ E04D *3/12*
U.S. Cl. 52—11 **1 Claim**



1. A roof and gutter saving device, comprising, in combination, an elongated central main body, a tongue portion along one longitudinal edge of said central main body and an overhang portion and a stabilizing tab along an opposite longitudinal edge of said central main body, a non-rigid joint formed along said longitudinal edges pivotally hinging said tongue portion, said overhang portion and said stabilizing tab thereto; and said stabilizing tab being bent into a longitudinally extending open loop for snap clipping around a downwardly inner, rear lip formed along a front outer edge of a roof gutter.

4,445,302

BUILDING ROOF STRUCTURE

Charles Dean, 2444 McGregor Blvd., Fort Myers, Fla. 33901

Filed Jun. 8, 1982, Ser. No. 386,342
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—90 **20 Claims**

1. A roof structure for metal buildings comprising:

building support elements;

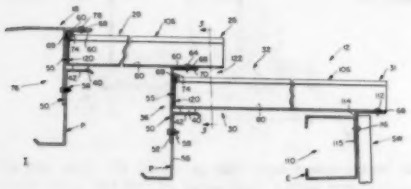
a plurality of elongate roof panels overlying said building

support elements, said panels each having a first end edge located nearer a building ridge than a panel second end edge, said panels having side edges which extend transversely of said building support elements and backstop means between the side edges at one end of each panel;

said plurality of panels including a plurality of first panels having said second end edges overlapping the first end edges of a plurality of second panels to define end laps;

a clip located adjacent to said end laps attaching each of said second panel first ends to one building support element;

an L-shaped bracket located adjacent to said end laps attaching said first panel second ends to said one building support element, said bracket including a first leg attached to said one building support element and a second leg extending longitudinally of said roof panels away from said one building support element toward said second panel second end edge;



attaching means attaching said bracket second leg to said first panel second end, said attaching means being located to be spaced from said second panel first end and said first panel resting on said bracket second leg; and

closure means interposed between said attaching means and said bracket first leg so that said attaching means is located outside of the area enclosed by the roof structure.

4,445,303

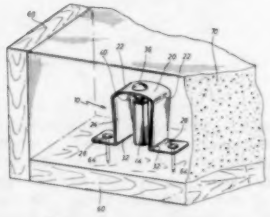
WEDGE-TYPE CONCRETE INSERT

Milton W. Judkins, 4606 Birch, Bellaire, Tex. 77401

Filed Apr. 26, 1982, Ser. No. 371,562

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—98 **2 Claims**



1. A concrete anchor suitable for a concrete slab, comprising:

a first pair of generally aligned anchoring surfaces which include first and second ends, said anchoring surfaces being arranged to diverge such that said first ends are separated by a greater distance than said second ends;

a pair of generally flat, spaced, generally coplanar tabs suitable for positioning the anchor on a form or the like during installation, each tab being interconnected with a respective second end of said anchoring surfaces such that said tabs can be broken away from said anchoring surfaces;

an opening in each tab to receive a means for securing the anchor to a form or the like;

an additional anchoring surface interconnecting said first ends of said first pair of anchoring surfaces; and

means interconnected with said additional anchoring surface for coupling an object to said anchor such that the weight of said object is transmitted from said coupling means to said additional anchoring surfaces and then to said diverging first pair of anchoring surfaces.

4,445,304

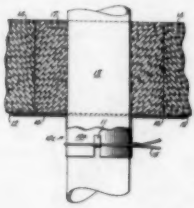
METHOD AND APPARATUS FOR SUPPORTING A VERTICAL CYLINDER OF WET CEMENT SURROUNDING A VERTICAL PIPE PASSING THROUGH A HORIZONTAL CONCRETE SLAB

Andrew Koda, 1238 14th Ave. N., Naples, Fla. 33940

Filed Mar. 19, 1981, Ser. No. 245,267

Int. Cl.³ E04B *5/48;* **E04F** *17/08;* **E04G** *23/00*

U.S. Cl. 52—127.3 **4 Claims**



1. A method of filling the space between a vertical pipe and a horizontal concrete slab with wet cement, comprising wrapping one leg of an L shaped piece around the vertical pipe just below the slab, the other leg of the piece being slit to form a series of slats radiating horizontally around the pipe, slipping a circular sheet of flexible moisture resistant material about the pipe just above the slats of the piece, pushing the piece upwardly on the pipe so as to press the sheet firmly against the lower face of the slab, securing the sheet and piece in position, and then pouring wet cement into the space between the pipe and the slab, which wet cement is supported while drying by the sheet and L-shaped piece.

4,445,305

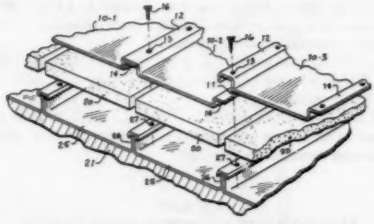
INSULATING SECONDARY ROOF SYSTEM

Thomas A. Orie, Sr., 3224 Heartwood Ave., Orlando, Fla. 32807

Filed Sep. 27, 1982, Ser. No. 424,852

Int. Cl.³ E04C *1/00;* **E04B** *1/74;* **E04D** *1/00*

U.S. Cl. 52—309.9 **5 Claims**



1. An insulative secondary roof system for installation over an existing metal roof having a plurality of structural roof panels, each panel having an elongate rectangular flat portion, the flat portion having an upturned edge along each longitudinal side thereof, the upturned edge being contiguous with an upturned edge of an adjacent panel and joined thereto,

whereby each panel forms a rectangular channel, the secondary roof system comprising:

a plurality of elongate, rectangular insulating panels, each of said insulating panels having a width approximately equal to the width of the existing roof channel and a thickness approximately equal to the depth of the channel, said insulating panels disposed in the existing roof panels in total contact with the flat portion of the roof panels;

a plurality of elongate, rectangular secondary metal panels, one of said metal panels disposed over each of said insulation panels, each of said secondary metal panels having upturned edges, one of said edges having an inverted L-shaped portion and the other edge having an inverted U-shaped portion, said U-shaped portion of each of said secondary panels formed to fit over said L-shaped portion of its adjacent one of said secondary panels to thereby interlock with each other, said inverted U-shaped portion adapted to fit over and to contact the joints of said existing metal panels; and

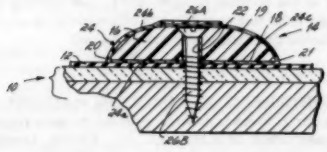
a plurality of screws driven through said inverted U-shaped portions, said inverted L-shaped portions, and said existing metal panel joints for securing said secondary panels to said existing roof structure.

4,445,306

MECHANICALLY ATTACHED ROOFING SYSTEM

Roy F. Schauffele, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio

Filed Jun. 4, 1982, Ser. No. 385,058
Int. Cl.³ E04B 5/00
U.S. Cl. 52—410 **14 Claims**



1. A system for mechanically attaching a waterproof membrane to a roof structure upon which the membrane is positioned, comprising:

an elongated fastening bar having bottom and top surfaces separated by spaced parallel longitudinal edges, said bar being positionable above said membrane with said bottom surfae lowermost,

an elongated waterproof strip having a length coextensive with that of said bar, said strip having an elongated intermediate region disposed between elongated marginal regions, said strip being positioned with said intermediate region located between said bar and said membrane in underlying relation to said bottom surface and with said marginal regions at least partially overlapping each other above said top surface, whereby said bar is fully encircled by said strip, and

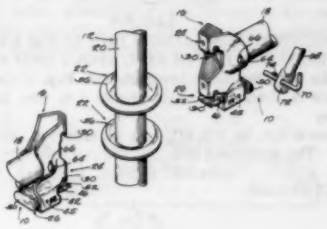
a plurality of fasteners each having an integral head and shank, said fasteners having their respective heads proximate said top surface of said bar in underlying relation to at least one of said encircling marginal regions and their respective shanks extending through said bar, intermediate region of said strip and membrane into said roof structure to anchor said bar to said roof structure with said intermediate region of said strip and underlying membrane sandwiched therebetween.

4,445,307

SCAFFOLD JOINT FOR A SCAFFOLD STRUCTURE

Joseph S. Puccinelli, and Paul J. Lukezich, both of Milwaukee, Wis., assignors to Figgie International Inc., Richmond, Va.

Filed Nov. 8, 1982, Ser. No. 439,824
Int. Cl.³ E04G 7/00
U.S. Cl. 52—638 **18 Claims**



1. A scaffold joint for connecting the ends of a horizontal scaffold member to a vertical scaffold member comprising:

a pair of ring support members fastened to the vertical scaffold member in a vertically spaced relationship;

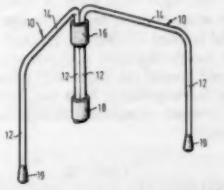
an end connector assembly fastened to the end of a horizontal scaffold member, said end connector assembly comprised of an end connector member and a locking member slidably mounted thereon, said end connector member having a pair of ring engagement portions adapted for removable engagement with said spaced ring support members, said locking member adapted when moved to its locked position to make tight contact with one of said ring support members to thereby cause said ring engagement portions to be forced into tight contact with said ring support members.

4,445,308

REINFORCEMENT SUPPORTS

Leonard G. Taylor, St. Martins, New Zealand, assignor to Allied Steel and Wire Limited, Cardiff, Wales

Continuation of Ser. No. 134,006, Mar. 26, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 339,656
Claims priority, application New Zealand, Mar. 26, 1979, 190004; Mar. 27, 1979, 191391
Int. Cl.³ E04C 5/16
U.S. Cl. 52—687 **14 Claims**



1. A support for maintaining concrete reinforcement at a predetermined level during the pouring of concrete thereabout comprising an assembly of two adjacent inverted 'U' shaped metal yokes, each yoke having a pair of substantially parallel and vertical limbs and a bridge interconnecting the upper ends of the vertical limbs, and connection means interconnecting two adjacent limbs of the two adjacent yokes, characterized in that the interconnection means comprises two couplings mutually spaced along the limbs and each encircling and frictionally engaging both limbs whereby the two limbs are held positively in mutually parallel contacting relation to each other in a relatively rigid manner and the two yokes are

angularly displaceable relative to each other about an axis passing through the couplings between a storage position in which the respective bridges are maintained substantially parallel to each other by the friction of said couplings and an operational position in which the respective bridges are maintained at an angle relative to each other by the friction of said couplings for the support of reinforcement thereon during the pouring of concrete around the support and reinforcement.

4,445,309

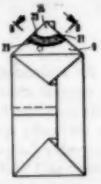
METHOD OF MAKING A LIQUID PACKAGING CONTAINER WITH POURING SPOUT AND AIR INLET

Wilhelm Reil, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Fed. Rep. of Germany

Division of Ser. No. 179,331, Aug. 18, 1980, Pat. No. 4,367,828. This application Sep. 30, 1982, Ser. No. 431,412

Int. Cl.[3] **B65B** *61/18*

U.S. Cl. 53—410 **3 Claims**



1. The method of making a packaging container of cardboard, paper or the like which has on at least one side thereof a double-thickness wall portion forming a spout from which the contents of said container can be poured when opened, the interior of which communicates with the interior of the container, which wall portion is provided with a strip of material which can be gripped by the fingers for opening said spout, comprising the steps of:

forming and filling with a liquid and closing such container to form such double-thickness wall portion so that facing sides of said wall portion are in mutual engagement across the area of said spout, and thereafter forming in said wall portion across the area of said spout at least one score line which penetrates through only one of said double-thicknesses of said wall portion along which said wall portion may be severed upon lifting of said strip of material with said fingers to form said spout,

forming in said double-thickness wall portion, closely adjacent to said score line across the area of said spout between the interior of said container and said score line, at least one fluid-tight weld seam of relatively narrow configuration adapted to be easily torn apart when said strip of material is lifted by said fingers, and

folding said double-thickness wall portion so that the facing sides of said double-thickness wall portion in the area of said score line and said at least one fluid-tight weld seam remain in mutual engagement during transportation prior to opening.

4,445,310

PROCESS AND INSTALLATION FOR SUPPLYING CAPS TO A CLOSURE MACHINE

Albert Scheidegger, Villeurbanne, France, assignor to Seal Societe de Conditionnements en Aluminium, Paris, France

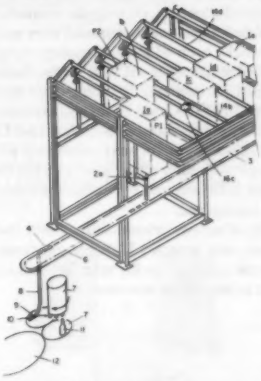
Filed Nov. 6, 1981, Ser. No. 318,961

Claims priority, application France, Nov. 14, 1980, 80 24691

Int. Cl.[3] **B65B** *57/00, 57/02;* **B67B** *3/26*

U.S. Cl. 53—485 **12 Claims**

10. A process for continuously supplying fragile caps, in a given orientation, to a closure machine operating at a high rate (C), from at least N+1 cells for producing said caps, N being the minimum number of cells necessary to comply with the nominal closure rate C, the caps being collected at the outlet of the cells and transferred towards the closure machine by an endless chain conveyor with successive cavities, comprising the steps of transferring the caps between each cell and the conveyor by an individual channel, detecting mini and maxi levels in each individual channel, each cell being operable at two rates, a normal rate $(C/N)+\epsilon$ and a lower rate $(C/(N+1))-\epsilon'$, varying the rate of each cell in accordance to the levels detected in the corresponding channel, each individual channel being provided with an outlet selector, and feeding



the caps from the outlet selectors into the successive cavities of the conveyor, each cavity thus being associated with one of the successive individual channels, transferring the caps between the conveyor and the machine by a main channel, detecting mini and maxi levels in the main channel, the conveyor being a two-speed cavity-type conveyor, the maximum rate of which is at a minimum equal to the rate of production of the N+1 cells and can be reduced to a lower rate corresponding at maximum to the nominal closure rate C, and causing the conveyor to go from one speed to the other speed in accordance with the levels detected in the main channel.

4,445,311

PORTIONING AND PACKING MACHINE

Jürgen Nentwig, Vienna, Austria, assignor to Asto Import- und Exportgesellschaft M.B.H. & Co. Kg., Vienna, Austria

Filed Jan. 27, 1982, Ser. No. 343,268

Int. Cl.[3] **B65B** *49/08, 11/40*

U.S. Cl. 53—575 **6 Claims**

1. A portioning and packaging apparatus for a pasty substance, comprising:

a vertically extending feed tube continuously supplied with said pasty substance;

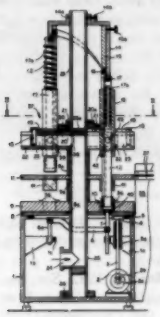
a metering head rotatable around said feed tube and formed with a plurality of angularly spaced generally radially extending metering cylinders communicating with said feed tube only over a portion of the angular displacement of said head about said feed tube, and respective pistons displaceable in said cylinders for metering said substance therefrom, said head being provided with a respective filling tube communicating laterally with each of said cylinders and vertically displaceable on said head;

a forming table rotatable about the axis of said feeding tube and formed with a plurality of forming cavities each aligned with a respective one of said filling tubes;

a layer-receiving table between said forming table and said head and rotatable with said head about said axis, said forming table being provided with a plurality of passages each aligned with the respective one of said cavities whereby respective layers of wrapping material can be applied to said layer-receiving table over a respective passage therein for entrainment into a respective cavity to form a package;

first cam means on said feeding tube operatively connected to said pistons for controlling the displacement thereof during rotation of said head; and

second cam means fixed to said feeding tube for controlling the vertical displacement of said filling tubes whereby said



filling tubes deposite said substance in said packages in said cavities.

4,445,312

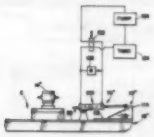
MOWER HEAD WITH MOVEABLE GUARD

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Filed Sep. 10, 1982, Ser. No. 416,580

Int. Cl.³ A01D *67/00, 75/20*

U.S. Cl. 56—15.5 **14 Claims**



6. A mower comprising:

a prime mover which is self-propelled in at least a forward and rearward direction;

an arm assembly operatively connected at a first end with the prime mover; and

a mower head operatively connected with a second end of the arm assembly, the mower head including:

a cutter which is positionable by the arm assembly to rotate in a circular cutting path;

a shield including: a deck extending above and substantially parallel to the cutting path, the deck defining a cutter exposing area along a forward side thereof between forward extending first and second deck extensions; a downward extending skirt which extends downward from the deck forward extensions, from a deck rear side, and from the deck between the forward and rear side; track means extending generally rearward along the first deck forward extensions;

a guard assembly which is disposed along the forward side of the shield and which is slidable parallel to the cutting path in the track means, along a generally forward to rearward path for selectively exposing and covering the cutter exposition area and,

a biasing means for biasing the guard assembly forward with a selected force such that upon encountering an object with greater than the selected force, the guard is rearwardly movable to expose the cutter.

4,445,313

HAY CUTTING MACHINES

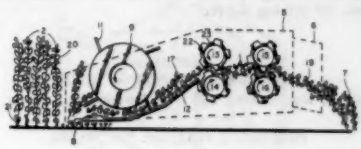
Thomas Elliott, and Todd Knecht, both of Rd. 5, Box 215, both of Towanda, Pa. 18848

Filed Aug. 19, 1982, Ser. No. 409,705

Int. Cl.³ A01D *49/00*

U.S. Cl. 56—16.4 **6 Claims**

1. In an improved hay cutting machine for promoting the drying of hay or other forage crops of the type having: means for supporting the hay cutting machine above the ground; means for propelling the hay cutting machine through the crop to be mowed; means for cutting the crop; conditioning means for crimping the crop stems comprising a pair of cylindrical rollers mounted transversely to the direction of crop movement through the conditioner at least one of said rollers having a plurality of longitudinal ribs disposed around the circumference of the roller; tensioning means for urging the pair of rollers toward each other; said cut crop being guided in a stream from the cutting means between the rollers, whereby



the crop stems are crimped at intervals along the stems; wherein the improvement comprises:

a plurality of additional pairs of rollers mounted parallel to the said first pair of rollers located such that the stream of cut crop moves immediately from the first pair of rollers through each additional pair of rollers in sequence;

each additional pair of rollers being located along the stream of cut crop in synchronization with the earlier pairs of rollers, whereby the stems of the cut crop are crimped at different points along the stems than the points crimped by the first or earlier additional pairs of rollers.

4,445,314

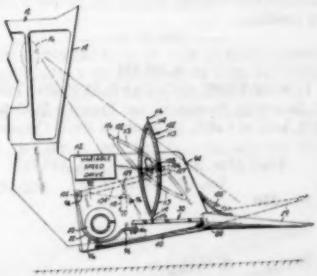
SUNFLOWER HEADER ATTACHMENT

Jacob N. Gust, West Fargo, N. Dak., assignor to Concord, Inc., Fargo, N. Dak.

Filed Feb. 22, 1982, Ser. No. 351,292

Int. Cl.³ A01D *45/00*

U.S. Cl. 56—126 **2 Claims**



1. A sunflower header device for attachment on a combine having a reciprocating sickle bar assembly at a front end thereof and an auger trough positioned rearwardly of the sickle bar assembly, the device comprising:

a plurality of spaced apart and parallel pans, each pan having a forward end and a rearward end and being secured at its rearward end to the sickle bar assembly to extend forwardly from the combine;

a plurality of brackets secured to each pan at its forward end;

a plurality of adjustable pan supports, each pan support having a first end and a second end, the first end of each pan support being selectively secured to one of the brackets, the second end of each pan support being pivotally secured to the auger trough, and the pan supports being extensible and retractable so that the height of the forward end of each pan is adjustable relative to the combine;

a plurality of elongated snouts, each snout having a front end

and a rear end, each snout being pivotally mounted at its rear end on the forward end of each pan, and each snout having a plurality of opposing similar top and bottom smooth sides joined by rounded edges, said edges and sides being tapered to form a rounded tip at the front end of the snout;

a side divider mounted at each end of the sickle bar assembly on the front end of the combine, and each divider having smooth sides and rounded edges;

a reel rotatably mounted at its ends adjacent the side dividers to extend over the pans and rotate on a generally horizontal axis for urging sunflowers into the combine; and

means for driving the reel.

4,445,315

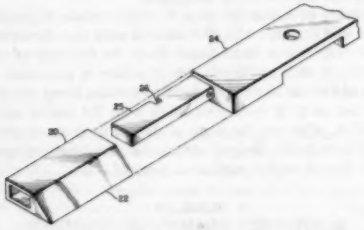
DISPOSABLE CUTTING EDGE

Gregory J. Roszkowski, 621 Tanglewood Rd., Derby, Kans. 67037

Filed Jun. 7, 1982, Ser. No. 385,901

Int. Cl.³ A01D *55/18, 75/18*

U.S. Cl. 56—295 **9 Claims**



1. In a system intended for use as a cutting rotary device comprised of a rotor and one or more detachable blades securely attached upon the rotor by a locking mechanism, said rotor having a universal mounting provision for attaching to the rotating output of a power source and containing an audible alarm mechanism effective any time the detachable blade having a disposable cutting edge is not properly installed and locked in position.

4,445,316

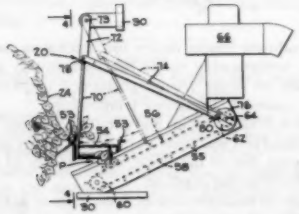
LOOSE VINE AND CANE ELIMINATOR

James T. Browning, Sunnyvale, and Franklin P. Orlando, Morgan Hill, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 31, 1983, Ser. No. 467,717

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—330 **14 Claims**



1. An apparatus for mechanically removing loose debris including long pieces of debris from a harvester, comprising:

means for moving the harvester along the row of living plants for removing fruit and loose debris therefrom,

first and second conveying means in said harvester with said first conveying means conveying fruit and loose debris longitudinally of the harvester to debris collecting point and said second conveying means then conveying the fruit and some debris away from said connecting point, and

finger means movable in a direction substantially perpendicular to said first conveying means for intercepting elongated pieces of debris at said collecting point and deflecting the elongated debris and other debris attached thereto transversely of the harvester into snagging engagement with the living plants being harvested for pulling the snagged debris from the harvester in response to the harvester moving away from the snagged debris.

4,445,317

SPLICING METHOD FOR SPUN YARNS

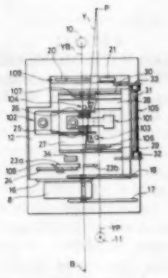
Hiroshi Mima, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Mar. 22, 1982, Ser. No. 360,062

Claims priority, application Japan, Mar. 26, 1981, 56-44967

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **6 Claims**



1. A splicing method for spun yarns which comprises sucking a yarn end on the package side by a first suction arm, gripping said yarn end on the package side between a turning lever and a supporting block of a yarn clamping device, then sucking a yarn end on the bobbin side by a second suction arm, gripping said yarn end on the bobbin side between a supporting plate and a supporting block of a clamping device, respectively, thereafter introducing the yarn ends into a splicing hole of a splicing apparatus by a yarn gathering lever, cutting the yarn ends by a yarn cutting device, then retreating the yarn gathering lever to adjust the length of each of the cut yarn ends, simultaneously untwisting both the yarn ends in a control nozzle, advancing the yarn gathering lever again to overlap both the yarn ends in the splicing holes and causing a compressed fluid to act on the overlapped portion of the yarn ends to effect splicing.

4,445,318

METHOD AND DEVICE FOR MAKING A KNOT-FREE THREAD CONNECTION BY SPLICING

Rolf Becker, Mönchen-Gladbach; Josef Bertrams; Franz Grabatsch, both of Wegberg; Gregor Kathke, Viersen; Wolfgang Kiesewetter, Willich; Herbert Knors, Mönchen-Gladbach; Jakob Leven, Wegberg; Erich Quack, Mönchen-Gladbach; Klaus Rautenberg, Erkelenz; Joachim Rohner, Mönchen-Gladbach; Klaus Rosen, Mönchen-Gladbach; Günter Wilms, Mönchen-Gladbach, and Heinz Zumfeld, Mönchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 367,118

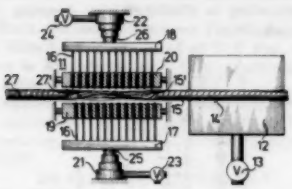
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114790

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **16 Claims**

1. Method of producing a knot-free thread connection by

splicing, which comprises mechanically mixing, alternately interlocking and anchoring individual fibers of the threads to



be joined to each other in a first pre-splicing operation, and subsequently further and finally intertwining and anchoring the threads to each other in a separate finish-splicing operation.

4,445,319

DEVICE FOR TYING A FIRST THREAD TO A SECOND THREAD BY SPLICING WITH PRESSURE GAS

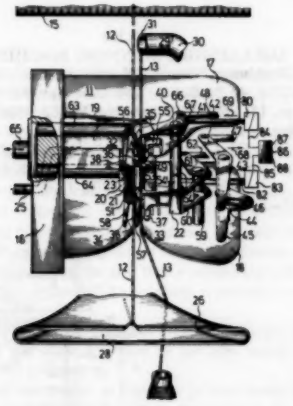
Joachim Rohner, and Heinz Zumfeld, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,424

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132894

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **3 Claims**



1. Device for tying a first thread to a second thread by splicing with pressure gas, the device having a splicing chamber formed with an elongated slot for inserting and tying the threads, at least one pressure-gas channel terminating in an interior space of the splicing chamber, a thread regulator movable from a thread take-up position to thread delivery position for laying the thread into the elongated slot of the splicing chamber, and controllable parts including thread severing devices for separating ends of the threads, a controllable and adjustable pressure-gas dosing device connected to the pressure-gas channel, a device disposed above the splicing chamber for taking up the thread end of the second thread, a device disposed below the splicing chamber for taking up the thread end of the first thread, a controllable thread gripper for the first thread, and a controllable thread gripper for the second thread, comprising an opening device in the thread gripper of the first thread, said opening device having a temporal priority over a second opening device in the thread gripper of the second thread, and the pressure-gas channel terminating eccentrically in the interior space of the splicing chamber for forming a vortex.

4,445,320

SPINDLE BRAKE

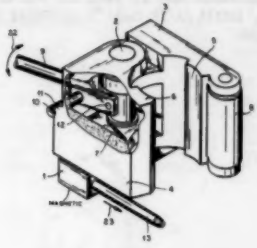
Günter Oppl, and Günther Schmitt, both of Hammelburg, Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Apr. 20, 1982, Ser. No. 370,054

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116480

Int. Cl.³ D01H *1/241*

U.S. Cl. 57—88 **7 Claims**



1. A spindle brake for a spinning or twisting spindle of the type in which a tangential belt engages a whorl on a spinning or twisting machine, said brake comprising:

a pair of brake jaws juxtaposed with one another across said whorl;

respective arms carrying said jaws, said arms being connected at one end by a common pivot so that said arms are swingable toward and away from each other about said pivot;

means for actuating said brake to swing said arms toward each other and engage said jaws with said whorl;

a belt-lifting roller at the other end of one of said arms engageable with said belt upon actuation of the brake to lift said belt from said whorl; and

a spreading spring biasing said arms away from one another, said pivot and said arms being mounted upon a support plate removably attachable to said machine.

4,445,321

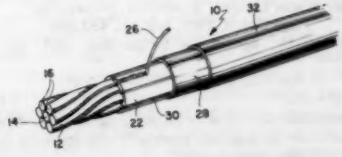
TENDON CONSTRUCTION FOR POSTTENSIONING PRESTRESSED CONCRETE AND THE METHOD OF MAKING SUCH TENDONS

Raymond E. Hutchinson, 51 Adelphi Ave., Providence, R.I. 02906

Filed Nov. 29, 1982, Ser. No. 445,278

Int. Cl.³ D07B *1/16, 1/14*

U.S. Cl. 57—223 **9 Claims**



1. A tendon for use in poststressing concrete comprising a multiple-wire strand wherein individual peripheral wires roughly abut each other to define a roughly geometric overall cross-sectional strand configuration having both internal and external interstices wherein said interstices are open ended crevices defined between adjacent wires, an encasement formed of a plastic completely surrounding the outside of said strand to form a smooth outer surface of circular cross-sectional configuration and having internal portions extending into said strand crevices, a thin friction reducing layer of grease-like material on the outer surface of said encasement

and a plastic jacket disposed over said encased strand whereby said strand may freely move longitudinally relative to said jacket.

4,445,322

APPARATUS TO MEASURE YARN TENSION

Larry S. Satterfield, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 236,966, Feb. 23, 1981, Pat. No. 4,393,725. This application Nov. 17, 1982, Ser. No. 442,322

Int. Cl.[3] **D01H** *13/32;* **G01L** *5/10;* **G01H** *13/00*

U.S. Cl. 57—264 **2 Claims**

1. Apparatus to provide a false twisted continuous filament, synthetic yarn comprising: a yarn supply means, a false twist mechanism, a primary heater means between said yarn supply means and said false twist mechanism, a yarn take-up means, a secondary heater means between said false twist mechanism means and said yarn take-up means and a means to measure the tension of the yarn being supplied from said yarn supply means, said means including a means to vibrate the yarn at its harmonic frequency and a means to measure the harmonic frequency of the yarn.

4,445,323

APPARATUS FOR THE CONJOINT GRIPPING OF BOBBINS ON A RING SPINNING OR RING-TWISTING MACHINE

Arthur Wuermli, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 4, 1982, Ser. No. 432,558

Claims priority, application Switzerland, Oct. 29, 1981, 6911/81

Int. Cl.[3] **D01H** *9/08;* **B66C** *1/46*

U.S. Cl. 57—275 **7 Claims**

1. An apparatus for the conjoint gripping of empty or wound bobbins on a textile machine, especially ring-spinning or ring-twisting machines, comprising:

pin members formed of a rigid material and insertable into the bobbins which are to be gripped;

a support member extending along the textile machine;

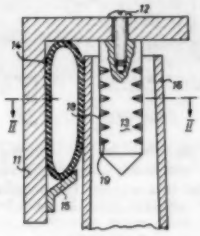
said pin members being carried by said support member;

an expansible hose member extending along said support member, wherein the internal pressure of said expansible hose member can be varied;

said expansible hose member extending in the direction of the bobbins for pressing the bobbins against the pin members inserted therein when the internal pressure of the expansible hose member is increased;

each pin member having a side surface at a side thereof facing the hose member;

said side surface being bounded by two substantially straight edges extending in the lengthwise direction of its pin member; and



said substantially straight edges serving as abutment means for an internal surface of the related bobbin when such bobbin is pressed against the pin member.

4,445,324

COLLAPSIBLE SPINNING MACHINE

James S. Watkinson, Nannup, Western Australia, Australia

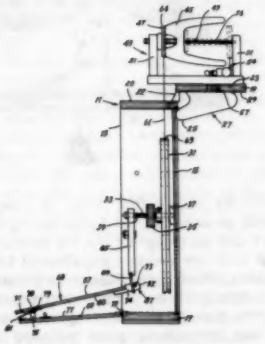
PCT No. PCT/AU81/00122, 371 Date Apr. 13, 1982, 102(e) Date Apr. 13, 1982, PCT Pub. No. WO82/00667, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 25, 1981, Ser. No. 375,034

Claims priority, application Australia, Aug. 25, 1980, PE5216

Int. Cl.[3] **D01H** *3/00, 1/04*

U.S. Cl. 57—316 **21 Claims**



1. A manually operated spinning machine comprising a compartment having an open front and a lid at the top, the lid being movable between a closed position and an open position, a wheel housed within the compartment for rotation in a vertical plane substantially parallel to the front, a spinning head having a pulley, the spinning head being mountable on the inside of the lid so that when the lid is in the open position the spinning head can be positioned with the pulley aligned with the wheel, a transmission element for operatively coupling the wheel and the pulley when the pulley is aligned with the wheel, and treadle means connectable to the wheel through a crank for effecting rotation of the wheel.

4,445,325

INSTALLATION FOR GENERATING SUPERHEATED PROCESS STEAM FROM SALT-CONTAINING RAW WATER

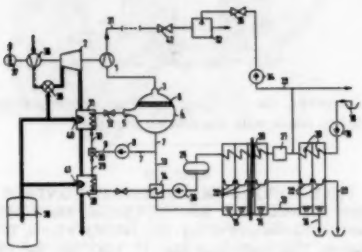
Herbert Tratz, Ottensoos; Hermann Finckh, Nuremberg, and Konrad Künstle, Röttenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim An der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 265,627, May 20, 1981. This application Aug. 24, 1983, Ser. No. 526,213

Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020297

Int. Cl.³ F02G 1/02; F01K 17/00

U.S. Cl. 60—39.182 4 Claims



1. Apparatus for generating superheated process steam from raw water containing salt, using preheaters for heating comprising

(a) preheaters to impart sufficient heat to raw water containing salt flowing therethrough under pressure to permit subsequent evaporation of said water,

(b) a decompression chamber for collecting a body of unevaporated water and salt above which is a vapor space containing steam, said decompression chamber being free of cooling means to condense the steam therein and at a lower pressure than the raw water containing salt flowing through the preheaters to promote evaporation of water from the raw water

(c) said decompression chamber connected to said last preheater in the flow direction of the raw water flowing through the preheaters,

(d) a control interposed in the flow of raw water between said last preheater and said decompression chamber to regulate the flow of raw water to the decompression chamber, said water partially evaporating with the unevaporated water and salt collecting as said body in the decompression chamber and the evaporated water collecting in said vapor space above said body,

(e) a compressor with its suction side connected to the vapor space of the decompression chamber for withdrawal of steam therefrom and compression and heating of the withdrawn steam to produce superheated steam,

(f) a gas turbine coupled to the steam compressor,

(g) conduit means to flow hot exhaust gases from said gas turbine to said preheaters, the heat of the hot exhaust gases heating the raw water in the preheaters,

(h) a generator also coupled to said gas turbine for generating electricity,

(i) a blow-down line connected to the decompression chamber for passage therefrom of the unvaporized raw water containing salt, and

(j) a heat exchanger inserted into the blow-down line for preheating the flowing stream of raw water before the raw water is further heated by said hot exhaust gases.

4,445,326

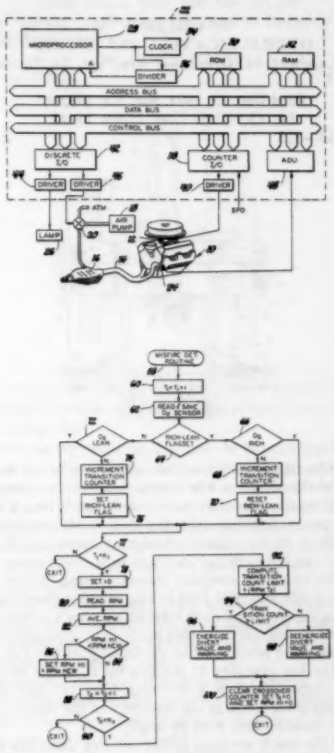
INTERNAL COMBUSTION ENGINE MISFIRE DETECTION SYSTEM

Harry H. Lyon, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1982, Ser. No. 380,630

Int. Cl.³ F02B 75/10

U.S. Cl. 60—277 4 Claims



4. A misfire detection and protection system for use with a motor vehicle internal combustion engine having cylinders into which an air-fuel mixture is drawn and ignited to undergo combustion, an exhaust passage, an oxidizing catalytic converter, air supply means for providing secondary air to the exhaust passage at an air intake point upstream of the converter to establish an oxidizing atmosphere to promote oxidation of certain exhaust gas constituents, and a closed loop air-fuel ratio controller including an oxygen sensor disposed in the exhaust passage upstream of the air intake point that provides a signal representing the oxidizing or reducing state of the exhaust gases, the oxygen sensor providing a signal representing an oxidizing state when the sensor is exposed to an unburned mixture of air and fuel, the system comprising:

means effective to detect the frequency of the changes between the oxidizing and reducing states of the exhaust gases as represented by the oxygen sensor signal, the detected frequency being substantially less than the frequency of the combustion events in one of the cylinders during normal engine operation;

means responsive to the speed of the engine effective to provide an engine cylinder combustion signal related to the cylinder combustion frequency;

means effective to provide an engine misfire signal when the

detected frequency of the changes between the oxidizing and reducing states of the exhaust gases represented by the oxygen sensor signal attains a predetermined relationship to the engine cylinder combustion signal; and

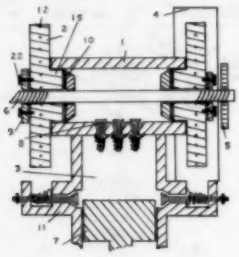
means responsive to the engine misfire signal effective to inhibit admission of air from the air supply means to the air intake point so as to prevent overheating of the oxidizing catalytic converter during the engine misfire condition.

4,445,327

HYDRAULIC CYCLO-JET ENGINE

Naeem B. Gabriel, 615 Greenwood Ave., Apt. #4, Trenton, N.J. 08609

Filed Dec. 23, 1981, Ser. No. 333,909
Int. Cl.³ F15B *7/08, 15/08, 15/18*
U.S. Cl. 60—325 **2 Claims**



1. A hydraulic cyclo jet engine which comprises: a master cylinder of the shape of the capital letter T, a compressing piston, said piston moves in the vertical line of that T shaped cylinder, two assembled sides for that master cylinder, the sides are fixed to the master cylinder by screws, each one of these sides has semi conical carvings in it, these semi conical carvings are carved in a regular manner around the circumference of said side and they lean to one circular direction,

two rotating discs, and each rotating disc has a center hole in it, the rotating disc is of two portions, one portion is small and the other portion is big, the small portion of the rotating disc has plurality of pockets on it, at the bottom of each pocket there is a draining duct, the end of each draining duct opens in the thickness of the bigger portion of the rotating disc with an angle,

each of the small portions of the rotating discs fits exactly inside the master cylinder next to its assembled sides,

an axle and nuts, that axle goes through holes in the sides and in the rotating discs, the nuts are screwed on the axle to lock the parts together,

plurality of one way valves, these valves are positioned at the junction of the pumping vertical line and the cylinder,

two collecting containers, with one collecting container for one rotating disc.

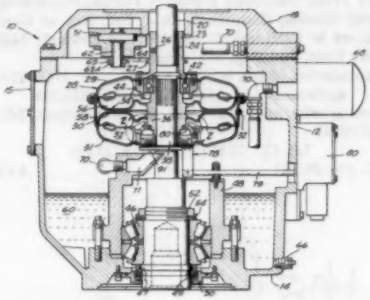
4,445,328

VARIABLE FILL FLUID COUPLING WITH CHARGING LIQUID COLLECTOR

Geoffrey H. Michels, Indianapolis, Ind., assignor to Indian Head Incorporated, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,315
Int. Cl.³ F16D *33/06*
U.S. Cl. 60—351 **10 Claims**

1. In a variable fill-type liquid coupling having a housing, a driving impeller rotatably mounted in the housing, a driven runner rotatably mounted within the housing in liquid coupling relation with the impeller, an active liquid chamber between the runner and the impeller, a mouth for receiving charging liquid directed into the active liquid chamber, and means for directing charging liquid from a liquid source to produce a flowing stream of liquid to enter the mouth, the improvement comprising charging liquid collection means mounted in the mouth for forcing the flowing stream of liquid into the active



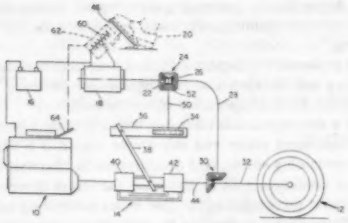
liquid chamber, the charging liquid collection means being mounted to rotate with the driving impeller.

4,445,329

FULL TORQUE TRANSMISSION CONTROL

Benjamin B. Drisko, P.O. Box 717, Camden, Me. 04843

Continuation-in-part of Ser. No. 148,163, May 8, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 359,047
Int. Cl.³ F16H *39/46*
U.S. Cl. 60—431 **2 Claims**



1. In a motor vehicle having an internal combustion engine with a throttle, a transmission with a variable output-to-input speed ratio, and drive wheels coupled to the engine through such transmission, the improvement comprising

a throttle control means connected to said throttle which puts said throttle in one of two positions, the first fully open and the second an idle position,

a throttle and transmission control system including

desired vehicle speed input means responsive to operator input producing a one time selected signal indicative of the drive wheel speed desired by the operator,

actual vehicle speed means connected to said drive wheels for generating a signal proportional to the drive wheel speed of the vehicle,

comparing means connected to said desired vehicle speed and actual vehicle speed means and to said transmission for comparing said desired speed means and said actual speed means and, responsive to results from such comparing, generating a control signal changing the output-to-input speed ratio of said transmission, said throttle control means being controlled automatically by the engine, and

said transmission control system being arranged and connected to be effective independently of the one-time selected signal, when said throttle control means puts said throttle in full open position, to increase the output-to-input speed ratio of said transmission reducing the engine

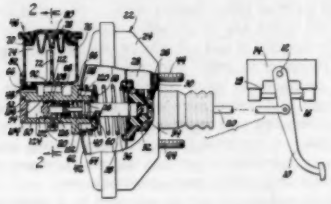
power output whenever said drive wheel speed is more than the indicated desired vehicle speed and to reduce the output-to-input speed ratio of said transmission increasing the engine power output whenever the drive wheel speed is less than the indicated desired speed.

4,445,330

MASTER CYLINDER ASSEMBLY AND BOOSTER

Wolfgang Meinat, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1981, Ser. No. 279,743
Int. Cl.³ F15B 7/00
U.S. Cl. 60—545 **6 Claims**



1. A master cylinder assembly having the characteristic of a short overall axial length and including compensation valve mechanism actuatable without lost brake pedal travel in the axial direction normally required to move pressurizing pistons to close and open compensation valves, said master cylinder assembly comprising:

a housing having a bore section provided with a bore extending axially therein and containing first and second pressurizing chambers and first and second pressurizing pistons axially movable in said bore, each of said pistons having a single seal continuously reciprocably sealing said pistons relative to the wall of said bore so as to require a short overall piston axial length and consequently contribute to the short overall master cylinder length, first and second housing sections extending laterally outward from and transverse to said master cylinder assembly housing bore section so as not to extend the overall axial length of said master cylinder assembly, said first and second transverse housing sections respectively having first and second passages therein, each of said passages extending into said housing bore section and transversely intersecting one of said pressurizing chambers, each of said passages having one end adapted to be connected to a brake circuit, first and second reservoir mounting bosses respectively on said first and second transverse housing sections at laterally outward locations relative to said housing bore section and respectively having third and fourth passages transversely intersecting the other ends of said first and second passages within said first and second transverse housing sections, a brake fluid reservoir mounted on said bosses and having first and second ports in respective brake fluid communication with said third and fourth passages, and first and second normally closed valves respectively in said first and second passages fluidly between said pressurizing chambers and said third and fourth passages;

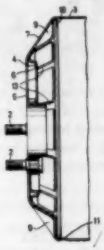
and means including first and second valve operator means respectively positioned externally on said first and second transverse housing sections and operable in response to brake pedal actuation and release for closing and opening said first and second valves in a manner that said valves are closed when said valve operator means operate in response to brake pedal actuation and are opened when said operator means operate in response to brake pedal release, the positioning of said valves and said valve operator means on said transverse housing sections instead of said bore section in cooperation with the response of said valves to brake pedal actuation and release rather than axial movement of said pistons further contributing to the short overall axial length of said master cylinder assembly.

4,445,331

LOW-PRESSURE CASING FOR A BRAKE BOOSTER

Rolf Weiler, Frankfurt-Sindlingen; Gilbert Bischoff, Hattersheim, and Rudolf Schlag, Frankfurt-Sossenheim, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,703
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041883
Int. Cl.³ F16J 11/02
U.S. Cl. 60—547.1 **17 Claims**



1. A low-pressure casing shell for a brake booster for use in an automotive vehicle adapted to mate with a second similarly shaped casing shell;

said two casing shells are designed to be sealingly interconnected, each of said casing shells including a substantially cylindrical casing section and a casing end wall section having a plane central end wall and a truncated-cone shaped section interconnecting said central end wall and said cylindrical casing section, the base of said truncated-cone shaped section being connected to said cylindrical casing section;

a circular reinforcement plate abutting against an inner surface of said central end wall, said plate being fastened to a selected one of a master brake cylinder and said vehicle by fastening bolts;

reinforcement elements disposed in a selected one of said truncated-cone shaped section and said reinforcement plate extending in the direction of the base of said truncated-cone shaped section; and

said reinforcement plate integrally including a prop ring disposed within said casing bearing against the inner surface of a circumferential edge of said casing at the transition from said truncated-cone shaped section into said cylindrical casing section.

4,445,332

HYDRAULIC HOSE ASSEMBLY AND METHOD

Jerome A. Thies, Geneseo, Ill., and Mark E. Tietje, Davenport, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1982, Ser. No. 361,307
Int. Cl.³ F16L 39/02
U.S. Cl. 60—455 **24 Claims**

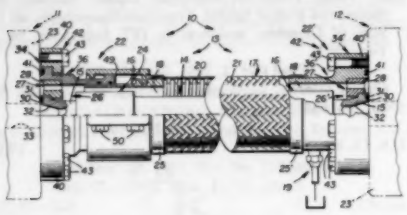
1. A hose assembly (13) comprising:

a flexible high-pressure hose (14),

an impervious flexible jacket (17) surrounding said hose (14) in out-of-contact relationship therewith to define a fluid chamber (18) therebetween, and

mounting means (22) for mounting each of said hose (14) and said jacket (17) on a support member (23) and maintaining them in out-of-contact relationship relative to each other, said mounting means (22) including first means (26) for mounting said hose (14) on said support member (23)

under a predetermined first sealing pressure and second means (34) for mounting said jacket (17) about said hose (14) and on said support member (23) under a predetermined second sealing pressure less than said first sealing pressure and for maintaining said jacket (17) in said out-of-



contact relationship relative to said hose (14), said first means (26) including clamping means (27) for applying said first sealing presure in response to simultaneous application of said second sealing pressure and having port means (35) for communicating fluid therethrough and to said chamber (18).

4,445,333

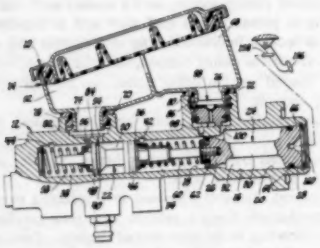
VALVE ASSEMBLY

John R. Coleman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1981, Ser. No. 284,062

Int. Cl.³ B60T *11/08*

U.S. Cl. 60—578 **3 Claims**



1. In a master cylinder having a fluid reservoir, a master cylinder body with a stepped bore formed therein, a mating stepped piston received in said bore and actuatable therein in apply and release modes, said bore and said piston defining a large diameter low pressure high volume displacing pressurizing first chamber and a smaller diameter high pressure low volume displacing pressurizing second chamber, and a valve chamber formed in said master cylinder body with a side wall and a bottom surface and a top opening into said reservoir, said bottom surface having first and second compensation ports extending therethrough and into said bore, said first compensation port being continually connected only with said first chamber of said bore and said second compensation port being connected only with said second chamber of said bore when said piston is in the fully released position of said release mode, an improved compensation control and blow-off unit valve assembly operable during the apply mode of said piston to selectively vent said first chamber and comprising:

a valve body having a lip type compensating seal extending about the outer periphery thereof and in sealing contact with said valve chamber side wall to permit fluid flow between said valve body and said valve chamber side wall in one direction only;

said valve body having a passage extending axially therethrough and connecting said reservoir and the portion of said valve chamber between said valve body and said valve chamber bottom surface and having a normally closed check valve cooperating therewith which when closed prevents unrestricted flow from said reservoir through said passage to said compensation ports when said piston is in either apply or release modes;

and means comprising a unitary valve body retainer and a check valve spring and a valve member forming the movable part of said check valve, said means being formed respectively by a circumferentially closed annular retainer ring operatively engaging said valve body and said valve chamber side wall to hold said valve body in a fixed position in said valve chamber, a cantilevered spring extending radially inwardly from said ring and terminating with its free end positioned centrally within said ring, and said valve member being formed on the free end of said cantilevered spring and cooperating with a valve seat formed by the one end of said valve body passage opening toward said reservoir to define said check valve;

and a continuously open restricted flow passage formed through said valve member and bypassing said check valve between said reservoir and said first chamber and providing a controlled leak accommodating a delayed pressure equalization between said reservoir and said first chamber under static pressure conditions;

said check valve opening in response to a predetermined blow-off pressure generated in said first chamber during pressure generating actuation of said piston from said fully released position in said apply mode to vent said first chamber to said reservoir.

4,445,334

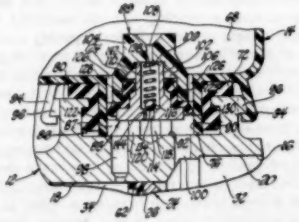
QUICK TAKE-UP MASTER CYLINDER

Dennis P. Derrick, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1981, Ser. No. 296,461

Int. Cl.³ B60T *11/26*

U.S. Cl. 60—585 **1 Claim**



1. In a master cylinder having a molded reservoir, a separate master cylinder body to which said reservoir is attached, and a quick take-up valve module, the improvement comprising:

said master cylinder reservoir having a bottom having a tubular spigot extending downwardly and integrally molded therewith to define a valve chamber, said spigot extending into a recessed boss formed as a part of said master cylinder body and engaging the bottom of the boss recess to define therewith the lower part of said valve chamber; integrally molded retainer means extending from said reservoir bottom and snapping over said boss to retain said reservoir on said master cylinder body, said boss having means cooperative with said retainer means for that purpose, and a valve body integrally molded with said reservoir bottom in the upper portion of said spigot and extending into the fluid chamber of said reservoir above the upper surface of said bottom, said valve body having a passage formed axially therein and opening into the reservoir fluid chamber at its upper end, and other

passage means radially adjacent said spigot and connecting the reservoir fluid chamber and said valve chamber said valve body further having a shouldered recess opening downwardly into said valve chamber;

a valve seat member positioned within said valve chamber and having a flange operatively engaging the shoulder of said valve body shouldered recess and a valve-containing extension extending into said shouldered recess, a check valve passage extending from the lower portion of said valve chamber through said valve seat member and mating with said valve body passage and having check valve means therein acting to permit fluid flow only from the lower part of said valve chamber to said reservoir under control of a differential pressure exerted thereacross, valve seat support means extending downwardly from said flange and engaging the bottom of the boss recess while permitting fluid flow between the lower part of said valve chamber and said check valve passage, a valve seal sealingly engaging said valve seat member and said valve body at said shouldered recess to prevent fluid flow between said valve seat member and said valve body, said valve seal also having a flared lip extending generally radially outward and downward beyond said valve seat member and said valve body and engaging the inner wall of said spigot to close said other passage means against fluid flow from said valve chamber to said reservoir but permitting fluid flow through said other passage means from said reservoir to said valve chamber;

and a continuously open restricted flow passage bypassing said check valve means between the fluid chamber of said reservoir and said lower part of said valve chamber and providing a controlled leak accommodating a delayed pressure equalization between said reservoir and the lower portion of said valve chamber under static pressure conditions;

said check valve opening to a predetermined blow-off pressure generated in the lower portion of said valve chamber during a predetermined master cylinder actuation stage to vent the lower portion of said valve chamber to said reservoir.

4,445,335

MASTER CYLINDER ASSEMBLY

Wolfgang Melinat, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1981, Ser. No. 279,742

Int. Cl.³ B60T *11/28*

U.S. Cl. 60—589 **1 Claim**

1. In a master cylinder assembly:

a housing having a bore formed therein;

a pressurizing piston in said bore defining therewith a fluid pressurizing chamber, said piston movable between an active position to pressurize said chamber and an inactive position when said chamber is not pressurized, said master cylinder assembly having the characteristic of compactness along the axis of said bore;

a fluid reservoir in communication with said housing;

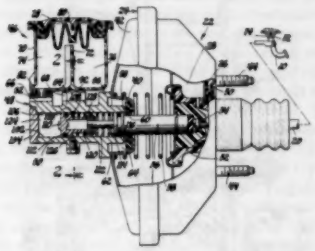
said housing also having a valve chamber formed therein, a first port connecting said reservoir and said valve chamber, a passage extending transversely skew to the axis of said bore to facilitate said characteristic of compactness and intersecting said pressurizing chamber;

said passage having one end defining a second port opening into said valve chamber and having another end defining a third port adapted to be connected to a pressurizable fluid circuit;

a valve in said valve chamber cooperating with said first port and having first means continuously urging said valve toward engagement with said first port to close said first port, and a cam ramp on said valve engageable for moving said valve;

a valve control member in said valve chamber having a cam thereon engaging said cam ramp and having a stem extending axially through said second port and into said passage where said passage intersects said pressurizing chamber so that one stem end is positioned in said pressurizing chamber to be cammingly engageable by said piston, said stem configured to permit fluid flow through said passage and second port, and second means acting on said valve control member and continuously urging said cam into engagement with said cam ramp;

said piston acting in a camming manner when moving to said inactive position to cause said valve control member to



move against said cam ramp and act to move said valve out of closing engagement with said first port, opening a fluid path between said reservoir and said pressurizing chamber;

said piston acting when moving to said active position to disengage said valve control member and permit said first means to move said valve to close said first port and to move said valve control member against the force of said second means to reposition said valve control member for valve opening actuation when said piston again moves to said inactive position.

4,445,336

INTERNAL COMBUSTION ENGINE EQUIPPED WITH SUPERCHARGER

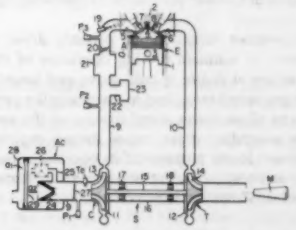
Kazuo Inoue, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1982, Ser. No. 346,379

Claims priority, application Japan, Feb. 6, 1981, 56-16340; Feb. 6, 1981, 56-16341; Feb. 10, 1981, 56-18557; Feb. 23, 1981, 56-25116

Int. Cl.³ F02B *33/44*; F02D *23/00*

U.S. Cl. 60—605 **6 Claims**



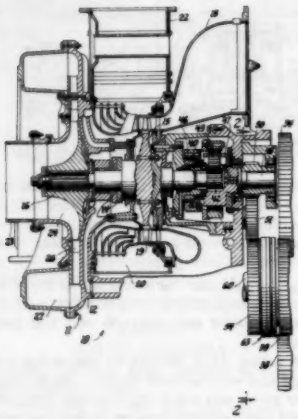
1. In an internal combustion engine equipped with a supercharger, including an intake port of the engine, an intake passage communicated with said intake port and atmosphere, and a compressor interposed in said intake passage for compressing the intake air from atmosphere flowing through said intake passage, the improvement wherein a control valve adapted for controlling backflow of intake air is disposed inside said intake passage upstream of and in series with said compressor in order to prevent backflow of the intake air flowing through said intake passage and a branch passage of smaller diameter than that of the intake passage branches from said intake passage between said control valve and said compressor and communicates with the atmosphere.

4,445,337

ENGINE WITH SPEED RESPONSIVE MULTI-RATIO TURBOCHARGER DRIVE

Charles H. McCreary, Oak Park, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1982, Ser. No. 422,545
Int. Cl.[3] F02B *37/10*
U.S. Cl. 60—608 **4 Claims**



1. In combination, an internal combustion engine having a turbocharger,

supplemental primary mechanical drive means in the engine for maintaining a minimum primary operating speed ratio of the turbocharger relative to engine speed when exhaust energy is insufficient to provide a higher turbocharger speed, said primary speed ratio providing charging air adequate for engine operation throughout its speed range, and the improvements comprising

secondary mechanical drive means in the engine for maintaining a minimum secondary operating speed ratio of the turbocharger relative to engine speed lower than the primary speed ratio and requiring reduced energy but capable of providing sufficient charging air for engine operation in a lower portion of its operating speed range, and

speed responsive means in the primary drive means and operative to maintain driving operation of the primary drive means at engine speeds above said lower portion of the engine speed range and to disengage the primary drive means to allow lower speed driving of the turbocharger by the secondary drive means during engine operation within said lower portions of its operating speed range,

whereby an energy efficient two speed supplemental turbocharger drive system is provided.

4,445,338

SWIRLER ASSEMBLY FOR A VORBIX AUGMENTOR

Stanley J. Markowski, East Hartford, Conn., and Richard S. Reilly, Lake Park, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

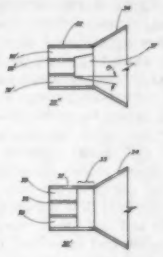
Filed Oct. 23, 1981, Ser. No. 314,285
Int. Cl.[3] F02G *1/00*; F02K *1/38*
U.S. Cl. 60—748 **4 Claims**

1. A swirler assembly for a VORBIX augmentor comprising:

a swirler section having means for generating a swirling air flow and a linear air flow;

a diffuser section section; and

a constant area mixing section connected at one end to the



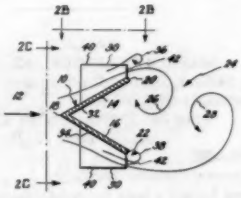
output of said swirler section and at the other end to the furthermost upstream end of said diffuser section wherein said airflows are intermixed prior to entering said diffuser section.

4,445,339

WINGTIP VORTEX FLAME STABILIZER FOR GAS TURBINE COMBUSTOR FLAME HOLDER

Lewis B. Davis, Jr., Schenectady, and Norman R. Dibelius, Ballston Spa, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,670
Int. Cl.[3] F02C *3/14*
U.S. Cl. 60—749 **9 Claims**



1. A flameholder arrangement for a gas turbine combustor or the like, said arrangement comprising:

a primary flameholder in the form of an elongated V-gutter extending across a main flow stream of gaseous components within the combustor, said V-gutter having a pair of elongated walls joined at a lineal vertex and diverging to respective trailing edges, and said V-gutter oriented with the vertex pointed upstream, said V-gutter being effective to shed first vortices from trailing edges of said V-gutter which circulate in essentially two-dimensional flow fields in planes normal to said elongated V-gutter to produce a downstream wake;

a plurality of winglets on outer surfaces of said V-gutter elongated walls;

said winglets being disposed at positions with respect to said trailing edges and at angles with respect to the main flow stream effective to shed second vortices rotating about axes generally parallel to the main flow stream; and

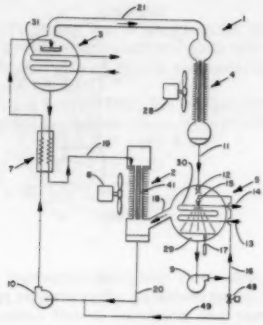
said first and second vortices producing a three-dimensional resultant flow in the wake downstream of said V-gutter effective to enhance mixing of the gaseous components.

4,445,340

DILUTION CYCLE CONTROL FOR AN ABSORPTION REFRIGERATION SYSTEM

Robert C. Reimann, Lafayette, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1983, Ser. No. 456,131
Int. Cl.[3] F25B 15/00
U.S. Cl. 62—101 9 Claims



9. A method of operating an absorption refrigeration system having a generator, an evaporator, an absorber, and a heat exchanger, with a solution pump for circulating weak absorbent solution from the absorber through the heat exchanger to the generator, and with a refrigerant pump for circulating liquid refrigerant from a sump in the evaporator through a dilution cycle control valve to the inlet of the solution pump to provide a dilution cycle when the refrigeration system is shut down, said method comprising the steps of:

sensing shutdown of the absorption refrigeration system;

generating a control signal after expiration of a preselected time period measured from the sensed shutdown of the absorption refrigeration system, during which the absorption refrigeration system is not restarted;

turning on the refrigerant pump and the solution pump, and opening the dilution cycle control valve to provide a dilution cycle for the absorption refrigeration system in response to generation of the control signal;

sensing the amount of refrigerant in the evaporator; and

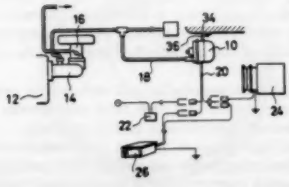
turning off the refrigerant pump and the solution pump, and closing the dilution cycle control valve, to end the dilution cycle when a preselected low amount of refrigerant is sensed in the evaporator.

4,445,341

AUTOMATIC SWITCHING SYSTEM FOR CAR COOLER

Mikio Hayashi, 26-5, Toyotama-minami 2-chome, Nerima-ku, Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,262
Int. Cl.[3] B60H 3/04; H01H 35/40
U.S. Cl. 62—133 2 Claims



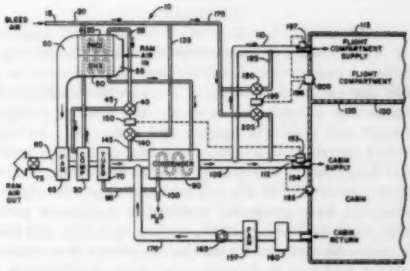
1. An automatic switching system for car cooler comprising a diaphragm room which is divided into two compartments by a diaphragm, a vacuum pressure which varies in accordance with the running conditions being introduced from an intake manifold of an engine into a first pressure compartment and the other open compartment being in air communication, a dielectric base plate which is provided adjacent to the open compartment and has a plurality of contacts to which a lead wire of an electric power source for a compressor of car cooler is connected, a center rod one end of which is attached perpendicular to the center of the diaphragm and the middle portion is reciprocably inserted into a center hole of the base plate, a switching member for making/breaking contacts attached to a spring member which is provided in the pressure compartment in compliance with the axial direction of the center rod for pressing the diaphragm to the direction of the base plate so that, when the vacuum pressure of the intake manifold is lowered in the acceleration period in which maximum engine power is needed, the diaphragm and the center rod is pressed by the spring member and the switching member is separated from the contacts to cut off the electric source of the compressor, and a slide member which is slidably fitted to the center rod side of the switching member and enforced by a slide spring whose center is fixed to a cover member of base plate and both ends are elastically in contact with the periphery of the slide member so as to prevent the surging of the center rod.

4,445,342

MULTI-ZONE TEMPERATURE CONTROL IN AIR CYCLE REFRIGERATION SYSTEMS

John L. Warner, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 26, 1982, Ser. No. 412,046
Int. Cl.[3] F28B 9/00
U.S. Cl. 62—172 2 Claims



1. An air cycle refrigeration system wherein pressurized air received by said system is expanded and cooled in a turbine and exhausted therefrom to first and second zones, said refrigeration system including control valve means for regulating the temperature of air exhausted from said turbine in response to the temperature of air supplied to said second zone, a first conduit providing uncooled air for mixture with said cooled air supplied to said first zone and a first trim valve communicating with said first conduit for regulating the flow of uncooled air to said first zone for regulation of the temperature thereof, said air cycle refrigeration system being characterized by:

a second conduit providing uncooled air for mixture with said cooled air supplied to said second zone;

a second trim valve communicating with said second conduit for regulating the flow of uncooled air to said second zone for the regulation of the temperature thereof; and

an actuator operating both said first and second trim valves in response to the temperature of said first zone, and effecting an opening of each of said trim valve while the other remains closed for maintenance of desired temperature in said first and second zones by direct control of said first and second trim valves to adjust the mixture of un-

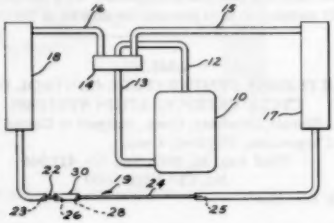
cooled air with cooled air admitted to said first and second zones and indirect control of said control valve means by adjustment of the temperature of air supplied to said second zone.

4,445,343

SONIC RESTRICTOR MEANS FOR A HEAT PUMP SYSTEM

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 4, 1983, Ser. No. 464,048
Int. Cl.[3] F25B *13/00*
U.S. Cl. 62—324.1 **8 Claims**



1. A reversible refrigeration system adapted for heating and cooling, a compressor, an indoor heat exchanger and an outdoor heat exchanger connected in reversible refrigerant flow relationship, a valve for reversing the flow of refrigerant through said system to operate said system in a heating or cooling operation with each of said heat exchangers arranged interchangeably as a condenser or as an evaporator, restrictor means connected between said heat exchangers for expanding refrigerant from condenser pressure to evaporator pressure during both the heating and the cooling operation, said restrictor means dimensioned for interjecting greater flow restriction between said heat exchangers when flow of refrigerant is in one direction than when the flow of refrigerant is in the other direction, comprising:

a first member having a bore of predetermined length and diameter therethrough;

a second member having a bore of a greater predetermined length and diameter therethrough relative to said first member;

volume means connecting said first and second members in series flow arrangement;

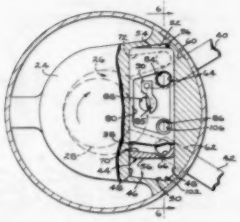
said diameter and length of each of said bores being dimensioned so that in said cooling operation, refrigerant, because of the length and diameter of the bore of said first member, flows therethrough in liquid state at below its sonic velocity and then, due to the length and diameter of the bore of said second member, emerges therefrom in a gaseous/liquid state at below its sonic velocity and at the cooling operating flow rate, and in said heating operation, refrigerant, because of the length and diameter of the bore of said second member, flows therethrough as a gaseous/-liquid mixture and then, due to the length and diameter of said bore of said first member, emerges at its sonic velocity thereby limiting the flow of refrigerant to the heating operation flow rate.

4,445,344

REVERSIBLE REFRIGERATION SYSTEM ROTARY COMPRESSOR

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 7, 1982, Ser. No. 415,064
Int. Cl.[3] F25B *13/00*; F04C *18/00*
U.S. Cl. 62—324.6 **5 Claims**



1. A reversible rotary refrigerant compressor comprising:

a hermetic casing containing a high pressure refrigerant gas;

a compressor unit positioned in said casing, including a cylinder having an annular chamber, spaced upper and lower end walls connecting with said cylinder and enclosing said annular cylinder, a rotor eccentrically rotatable within said cylinder with the peripheral surface of said rotor arranged to move progressively into sealing relation with successive portions of said annular cylinder;

a reversible motor in said casing having a shaft thereon extending into said unit for driving said rotor;

a radial slot in said cylinder communicating with said chamber;

a blade slidably positioned in said radial slot;

means biasing said blade against said rotor for following said rotor, thereby to divide said cylinder into interchangeable high and low pressure sides;

a valve chamber in said cylinder communicating with at least portions of said high and low pressure sides of said annular cylinder;

a first fluid passageway communicating between a first opening in said casing and said valve chamber;

a second fluid passageway communicating between a second opening in said casing and said valve chamber;

a switch-over member movable between end walls of said valve chamber, said switch-over member having a first low pressure cavity and a second low pressure cavity, means responsive to rotor rotation in one direction for moving said switch-over member to a first position during rotation of said rotor in said one direction wherein a passageway is established through said first cavity between said first fluid passageway and one side of said cylinder functioning as the low pressure side, and means responsive to rotor rotation in the other direction for moving said switch-over member to a second position during rotation of said rotor in said other direction wherein a passageway is established through said second cavity between said second fluid passageway and the other side of said cylinder functioning as the low pressure side;

a first high pressure port in said switch-over member communicating with said first fluid passageway when said switch-over member is in its first position;

a second high pressure port in said switch-over member communicating with said second fluid passageway when said switch over member is in its second position; and

a high pressure valved opening in said switch-over member being in communication with said other side of said cylinder functioning as the high pressure side when said switch-over member is in its first position to establish a

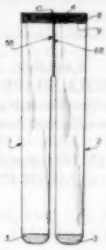
high pressure passageway between said other side of said cylinder and said second fluid passageway during rotation of said rotor in said one direction, and being in communication with said one side of said cylinder functioning as the high pressure side when said switch-over member is in its second position to establish a passageway between said one side of said cylinder and said first fluid pasageway during rotation of said rotor in said other direction.

4,445,345

PANTY-HOSE WITH AN ELASTIC BELT INCORPORATED THEREIN AND METHOD

Pierre C. A. Bédier, Moreuil, France, assignor to Societe Breilly S.A., Moreuil, France

Filed Feb. 10, 1981, Ser. No. 233,115
Claims priority, application France, Feb. 20, 1980, 80 03672
Int. Cl.[3] A41B *9/02*
U.S. Cl. 66—177 **7 Claims**



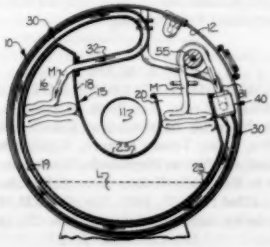
1. Mesh tights or panty-hose made from two knitted hose elements, slit and joined by a seam, with an elastic belt incorporated therein constituted by an elastic yarn added to the basic yarn, in which the elastic yarn is floated over a large fraction of its length, wherein before the slit and seam are made the elastic yarn is partially knitted one wale out of two at each course over the height of the elastic belt, in a strip a few centimeters wide, with the exception of the central wale where the elastic yarn is floated, at the centre of which strip is located the seam on the finished tights which corresponds to the location of the central wale.

4,445,346

APPARATUS FOR WET PROCESSING TEXTILE MATERIAL IN ENDLESS ROPE FORM

Fritz K. Witt, Charlotte, N.C., assignor to Keiltex Corporation, Charlotte, N.C.

Filed Feb. 7, 1983, Ser. No. 464,562
Int. Cl.[3] D06B *3/26, 3/28*
U.S. Cl. 68—178 **7 Claims**



1. An improved apparatus for wet processing textile material in endless rope form and traveling in an endless path about a horizontal axis within a predetermined compact space comprising:

a compact vessel for containing a treating bath of processing liquid in a lower portion thereof and having a predetermined inside peripheral cross-sectional dimension about the horizontal axis;

an elongate accumulator section within said vessel in said lower portion thereof for receiving, accumulating and passing portions of the rope of material therethrough and through the treating bath about the horizontal axis, said accumulator section having a length at least one half of the inside peripheral dimension of said vessel;

a rope transport tube within said vessel for receiving at an entrance end thereof the rope of material from one end of said accumulator section and for passing the rope of material therethrough about the horizontal axis and for discharging the rope of material at an exit end thereof into the other end of said accumulator section, said transport tube having a length of at least two-thirds of the inside peripheral dimension of said vessel; and

jet means positioned generally at said entrance end of said transport tube for creating a turbulent flow of processing liquid through said transport tube for carrying the rope of material therethrough and for treating the rope of material with the processing liquid under turbulent conditions;

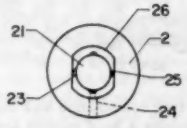
whereby, an endless path of travel for the rope of material is provided completely within said compact vessel which is longer than the inside peripheral cross-sectional dimension of said vessel allowing the travel of the rope of material through said transport tube to be maximized to in turn maximize treatment of the rope of material by the turbulent flow of processing liquid within said transport tube.

4,445,347

PADLOCK

Chih-Shan Tseng, No. 10-3, Cheng Shin, Pin Tung, Taiwan

Filed Jun. 29, 1981, Ser. No. 278,055
Int. Cl.[3] E05B *67/22*
U.S. Cl. 70—38 B **15 Claims**



1. A padlock comprising

a lock body that includes

an internally located, axially extending guide bar and an annular bore through one end of said lock body, said bore being closed at its inner end and defined by said guide bar and inner walls of said lock body,

a first plurality of pin holes in said lock body inner wall axially spaced therealong and in communication with said annular bore,

a second plurality of pin holes in said lock body located radially spaced around said closed end of said annular bore and in communication therewith,

a slot located outside said bore adjacent said closed end thereof and in communication therewith, and

a first and second recess in the other end of said lock body;

a U-shaped lock bar having a shorter leg and a longer leg, said longer leg thereof being resiliently mounted in said first lock body recess and movable between an open, unlocked position and a closed, locked position, said shorter bar leg having a notch on the inward side near the end thereof;

a locking element movable in said lock body slot for engaging said lock bar notch when in the closed position;

a cylindrical lock barrel mounted for rotation in either direc-

tion in said lock body annular bore, said lock barrel including

a central bore completely therethrough and defined by inner walls, the diameters of said central bore and said guide bar being selected so as to provide an annular gap between said guide bar and said lock barrel inner walls for receiving a matching key having radially extending lock teeth,

an axially extending slot in radial communication along the inner side with said central bore, said lock barrel slot for receiving the lock teeth of the key,

a first plurality of pin holes extending radially completely through said lock barrel walls, and axially and radially located so as to be in communication between corresponding ones of said first plurality of lock pin holes and said barrel slot, and

a second plurality of pin holes extending axially in the barrel inner walls at the barrel end adjacent the closed end of said lock body, said second plurality of pin holes being in communication with corresponding ones of said second body pin holes when said barrel is in an aligned position;

a first set of resiliently mounted pins in corresponding ones of said first plurality of body and barrel pin holes; and

a second set of resiliently mounted pins in corresponding ones of said second plurality of body and barrel pin holes.

4,445,348

COMBINATION LOCK

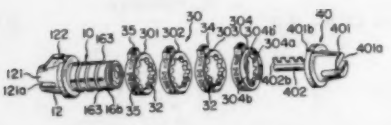
Hisashi Saitoh, Kasugai, Japan, assignor to Saikosha Works Ltd., Kasugai, Japan

Filed Jul. 22, 1981, Ser. No. 285,718

Claims priority, application Japan, Jul. 30, 1980, 55-109706[U]

Int. Cl.³ E05B *37/02*

U.S. Cl. 70—312 **8 Claims**



7. A cylinder type combination lock comprising:

a first body having a head portion and a cylindrical core portion formed with a key bore,

a plurality of inner rings, each of said inner rings having a slot in its inner circumference and at least one protrusion on its outer circumference,

first mounting means for mounting said inner rings on said cylindrical core portion to provide for rotation of said inner rings on said cylinder core portion, said inner rings being mounted rotatably to a position where the slots thereof are in groove alignment with said key bore to form a key groove,

a second body having a head portion and a key-like projection provided with key teeth of the same number as said inner rings, said key-like projection being adapted to be inserted into said key groove and to be locked therein when at least one of said inner rings is turned to be out of said groove alignment,

dial rings of the same number as said inner rings, each of said dial rings having a plurality of indicia on its outer circumference,

second mounting means mounting said dial rings on said inner rings, said second mounting means comprising at least one notch on said dial ring for accommodating said protrusion on said inner ring such that said dial ring may be mounted on said inner ring at a desired relative angular position, one of said dial rings constituting an outermost dial ring, one of said inner rings constituting an outermost inner ring and,

third mounting means mounting said outermost dial ring on said outermost inner ring, said third mounting means comprising a biasing element which is manually positioned in a mounting disposition to biasingly mount said outermost dial ring on said outermost inner ring and which is manually positioned to a release disposition to release said outermost dial ring from said outermost inner ring, whereby said dial rings are thereby removable from said inner rings to permit changing the rotational position of each dial ring relative to its respective inner ring to thereby change the combination of said lock without requiring any tools, said biasing element being a wire spring having a bent portion and two leg portions, said two leg portions being substantially parallel to one another, said outermost inner ring having a groove for receiving said leg portions, said bent portion of said wire spring being manually movable to thereby spread said leg portions so that the latter disengages from said groove in said outermost inner ring.

4,445,349

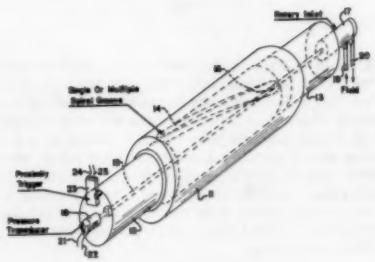
VARIABLE CROWN ROLL SHAPE CONTROL SYSTEMS

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 17, 1981, Ser. No. 322,196

Int. Cl.³ B21B *37/08*

U.S. Cl. 72—17 **9 Claims**



1. A rolling mill system for flat rolled products comprising a cylindrical roll body formed with at least one constant cross-section closed internal channel spaced uniformly from its working surface extending spirally as a fraction of a turn only around a portion of the cylindrical body surface from end to end thereof and adapted to contain hydraulic fluid under pressure and fluid pressure measuring means connected with that channel, thereby continuously measuring the pressure on the roll of that portion only of the moving flat rolled product immediately opposite that portion only of the channel at the work contact line of the rotating roll.

4,445,350

EXTRUSION METHOD USING HOT LUBRICANT

Masao Nishihara, Kyoto; Tomiharu Matsushita, Nishinomiya; Masataka Noguchi, Nishinomiya; Kazuo Arimura, Akashi; Akira Ohte, Kobe; Tetsuo Kimura, Kitakyushu; Akira Iwai, Kitakyushu, and Nobuo Hayashida, Kitakyushu, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 27, 1981, Ser. No. 325,552

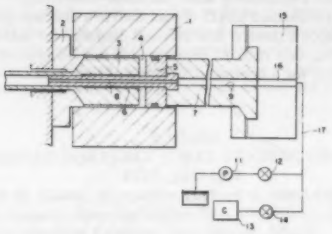
Claims priority, application Japan, Nov. 29, 1980, 55-169908

Int. Cl.³ B21C *23/32*

U.S. Cl. 72—38 **4 Claims**

1. A method for hot lubricated metal extrusion in which a billet of a metal selected from the group consisting of copper and a copper alloy is extruded into a tubular form by means of

a die and mandrel with an organic lubricant interposed between said billet and die and mandrel, said method comprising feeding air into the extruded tubular product through a feed passage in said mandrel to burn off the carbide of said lubricant



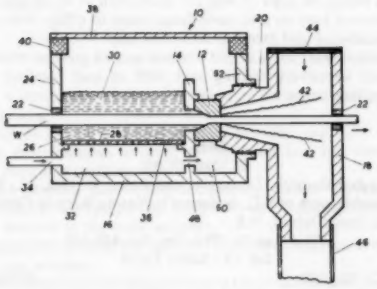
deposited on the inner surface of said extruded tubular product, said air being fed at a rate of Q falling in the range of $1.8d \times R \times V \leqq Q \leqq 14.2d \times R \times V$, wherein d is the inner diameter of the product in cm, R is the extrusion ratio, and V is the billet extruding speed in cm/sec.

4,445,351

FLUIDIZED BED LUBRICANT CONTAINER

Gary J. Thompson, Akron, and C. H. Carey, Cuyahoga Falls, both of Ohio, assignors to Morgan Construction Company, Worcester, Mass.

Filed Mar. 15, 1982, Ser. No. 357,928
Int. Cl.³ B21C 9/00
U.S. Cl. 72—43 **9 Claims**



1. In combination with a die assembly through which filamental material travels to be reduced, and which prior to said material entering said die assembly a dry granular lubricant compound is applied to said material upon its path of travel and when in said die assembly, heat is generated in the reduction process, a material lubricant assembly comprising:

a container means, comprising:

a first enclosure for retaining said lubricant and constructed to receive said material in a manner to cover a substantial portion of said material with said lubricant prior to its entry into said die assembly,

a second enclosure adjacent said first enclosure for housing said die assembly,

plenum chamber means associated with said first enclosure and communicating with said second enclosure around said die assembly for receiving pressurized fluid,

dividing means for forming said first and said second enclosures and said plenum chamber, including means between said plenum chamber and said first enclosure constructed and arranged to uniformly direct said pressurized fluid into said lubricant in a manner to fluidize said granules of said lubricant compound so as to cause said lubricant to adhere uniformly to said material, and further including means between said first enclosure and said second enclosure for supporting said die assembly and constructed and arranged in a manner to restrict the flow of said fluidized granules in said first enclosure, and

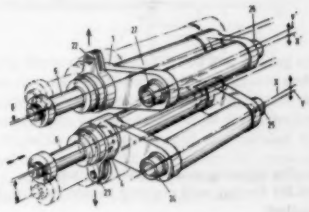
means for delivering said pressurized fluid into said plenum chamber where said pressurized fluid travelling into said second enclosure and circulating around said die assembly remains substantially free of said lubricant granules and acts to cool said die assembly.

4,445,352

RIM FORMER

Pieter M. Pols, Maasland, Netherlands, assignor to Machinefabriek A. Fontijne B.V., Netherlands

Filed Feb. 16, 1982, Ser. No. 348,711
Claims priority, application Netherlands, Mar. 13, 1981, 8101240
Int. Cl.³ B21H 1/10
U.S. Cl. 72—101 **6 Claims**



1. A rim forming apparatus, comprising a frame having upper and lower superimposed drivable and substantially vertically slidable spindles for applying thereon rim forming tools or rolls, the lower spindle being movable by means of a hydraulic cylinder relative to the upper spindle, while the upper spindle is tiltable in the plane through the two spindles for compensating for a deflection of the two spindles during the rim forming process, characterized by first and second swivelling arms, each having first and second ends, and each of the spindles carrying the rim forming rolls are received in the first end of a swivelling arm, with the second end of each swivelling arm being mounted in the frame, and each swivelling arm being rotationally supported in the frame by bearings, and the axis of the bearings of each swivelling arm being adjustable in the frame.

4,445,353

APPARATUS FOR MANUFACTURING HELICAL CORES

Alexander Taleff, Churchill Boro; Robert M. Brady, Salem Township, Westmoreland County, and Thaddeus E. Blaszczak, Indiana, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 17, 1981, Ser. No. 303,224
Int. Cl.³ B21D 11/08, 11/06
U.S. Cl. 72—136 **36 Claims**

1. An apparatus for manufacturing magnetic cores for electrical machines by bending a continuous strip of material edgewise into a coil, said strip having a plurality of recesses therein, said apparatus comprising:

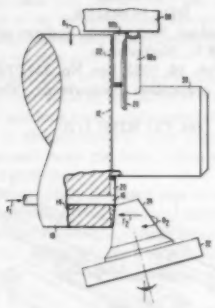
a rotatable mandrel having an axial surface, said axial surface having a plurality of holes therethrough;

a plurality of pins, each of said pins being slidably disposed in a preselected one of said plurality of holes, each of said pins being shaped to fit into one of said plurality of recesses in said continuous strip of material;

a raised portion of said axial surface, said raised portion being located at the radially outermost section of said

rotatable mandrel, said raised portion extending axially outward from said axial surface;

means for pressing said continuous strip of material against said axial face of said rotatable mandrel, said pressing means being shaped to cooperate with said raised portion to shape continuous strip of material into a predetermined cross section, said pressing means being associated with said raised portion of said mandrel to reduce the cross section of one edge of said continuous strip of material said predetermined cross section being generally uniform in shape along the length of said continuous strip of material;



means for rotating said rotatable mandrel;

means for forcing said pressing means toward said rotatable mandrel;

means for permitting movement of said pressing means relative to said axial face of said rotatable mandrel during deformation of said continuous strip therebetween to maintain a generally constant force on said continuous strip despite variations in strip thickness;

means for causing said pins to axially extend beyond said axial surface of said rotatable mandrel; and

means for retracting said pins from said axially extended position.

4,445,354

PROCEDURE AND EQUIPMENT FOR THE MANUFACTURE OF PIPES WITH EXTERNAL AND INTERNAL DIAMETERS VARYING IN STAGES

Gerd Pfeiffer, IM Look 55, D-4330 Mulheim; Horst Stinnertz, Knickelsdorf 89, D-4156 Willich 3, and Fritz Zeunert, Im Hag 2, D-4050 Monchen-Gladbach 2, all of Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,788

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129903

Int. Cl.[3] **B21B** *17/10*

U.S. Cl. 72—208 **13 Claims**

1. A cooperative pair of ring rolls for use in a cold pilger rolling mill for producing a tube having an external extending portion that varies in diameter, for example an enlarged end portion;

said rolls each having at least two different cooperative varying diameter tube producing grooves formed circumferentially around the periphery of said rolls, and

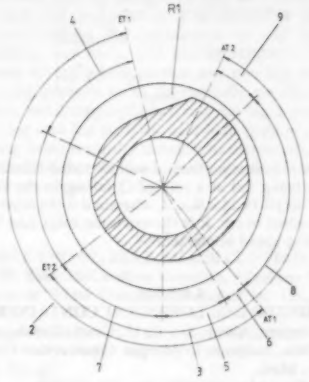
wherein said grooves are arranged in a common plane taken perpendicularly through the axis of rotation of said rolls, and

further wherein each of said grooves of a given diameter with reference to the processing sequence has after a deforming zone, a smoothing zone and as to at least one of said grooves an additional zone preceding the deforming zone for allowing movement of the tube relative to the roll.

7. A method for manufacturing a tube with varying external diameters by reducing a shell formed into a tube over a mandrel in a cold pilger rolling mill, which shell is worked between a set of driven ring rolls each having at least two different cooperative varying diameter tube producing grooves formed circumferentially around the periphery of said rolls, and each groove having a reducing range including a rotating and feeding zone, and a smoothing zone, the steps comprising:

(1) rolling a selected length of said shell in a first said groove to produce a desired first external diameter for said tube,

(2) rotating said rolls to bring a said second groove into operation for a continued working of said shell,



(3) rolling a selected length of said shell with said second groove to produce a second desired external diameter for said tube different than said first diameter,

said rolling in steps (1) and (3) being such as to subject said formed tube to said smoothing zones to effect final processing of said external diameters, and

(4) when said tube is in said first and second grooves rotating and selectively feeding said shell in said rotating and feeding zones.

4,445,355

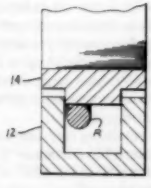
GUIDE TUBE

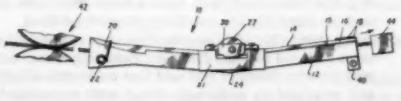
Mieczyslaw Budzich, Lexington, and Forest G. Fitz, Jr., West Columbia, both of S.C., assignors to Nassau Recycle Corporation, Staten Island, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,666

Int. Cl.[3] **B21B** *39/14*

U.S. Cl. 72—250 **4 Claims**





1. A guide tube for guiding a hot metallic rod being ad-

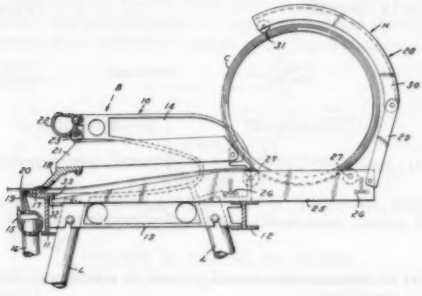
vanced along a path of travel within a rod mill and with the guide tube comprising a channel member of substantially U-shaped cross-sectional configuration, an elongated cover member mounted to said channel member and having an elongated tongue slidably received within said channel member, and fastening means releasably holding said cover member to said channel member, whereby a hot metallic rod being advanced through the guide tube may create limited relative movement between the channel and cover members without the members becoming misaligned or an interior edge of the guide tube becoming exposed that would scratch or mar the rod.

4,445,356

COMBINED PORTABLE SHEET BENDING BRAKE AND COIL HOLDER

Arthur B. Chubb, Wyandotte; Richard J. MacLeod, Milford, and James J. Rhoades, Garden City, all of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Filed Feb. 26, 1982, Ser. No. 352,893
Int. Cl.³ B21D *5/04*
U.S. Cl. 72—319 **19 Claims**



1. A combined portable sheet bending brake and coil support comprising

a frame having a fixed jaw and a movable jaw,

an anvil member secured to the fixed jaw and having a clamping surface,

said movable jaw having a clamping surface movable between workpiece clamping and non-clamping positions relative to the anvil member,

means for locking the movable jaw and workpiece in clamping position,

a bending member hinged about a hinge axis to the fixed jaw,

a coil holder having means for supporting a coil of sheet material, said coil holder being mounted on said frame so as to position the axis of the coil of sheet material substantially parallel to the hinge axis of the bending member,

said frame and said coil holder having interengaging means whereby said coil holder may be mounted and removed from said frame such that when the coil holder is in position, the coil is positioned such that the leading edge of the coil may be extended between the clamping surfaces of said anvil and movable jaw and clamped to permit cut off of a desired length of sheet material.

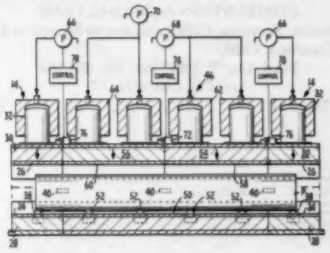
4,445,357

PIPE PRESS

Joseph E. Powers; Ranaldo H. Grimoldi; Calvin C. Williamson, and Alfred A. Bottini, all of Napa, Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Filed Nov. 3, 1980, Ser. No. 203,271
Int. Cl.³ B21D *5/00*
U.S. Cl. 72—399 **12 Claims**

1. A press for forming elongate heavy gauge steel pipe blanks into an arcuate cross-section, said press being adapted to accomodate blanks of different lengths within a predetermined range of maximum and minimum length and comprising: a main section of a length substantially equal to said minimum length, said section having complemental arcuate dies adapted to forceably engage therebetween an elongate heavy gauge steel pipe blank; an end section disposed to at least one end of and in alignment with said main section, and movable relative thereto, said end section being adapted to receive the end of a



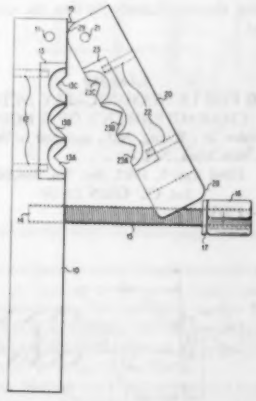
blank extending beyond the main section and having complemental arcuate dies adapted to forceably engage said end therebetween; independently actuatable operating means for the main and end sections to separately force the complemental dies of said respective sections toward one another to form blanks engaged between said dies into an arcuate cross-section; and, control means for said operating means to advance the die of the main and end sections at the same rate.

4,445,358

PORTABLE TOOL FOR AFFIXING TERMINALS ONTO BATTERY CABLES

Robert J. Gooding, Chester Springs, Pa., assignor to Action Concepts, Inc., Chester Springs, Pa.

Filed Jul. 26, 1982, Ser. No. 402,099
Int. Cl.³ B21D *37/10*
U.S. Cl. 72—416 **9 Claims**



1. Portable tool for affixing a terminal onto an electrical storage battery cable, comprising a handle member having a holding portion for supporting the tool manually and a clamping member juxtaposable thereto, each such member carrying along an adjacent edge and intermediate the ends thereof one of a pair of cooperating swaging jaws, pivot means carried by one end of the handle member and swingably carrying the clamping member at one of its ends, the other end of the clamp-

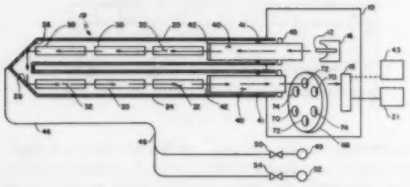
ing member having a slot therein, clamping screw means carried by and protruding from the handle member adjacent the holding portion and adapted to engage the sloted end of the clamping member, the clamping screw means being manipulatable to force the clamping member swingably against the handle member to close the swaging jaws.

4,445,359

SYSTEM AND PROCESS FOR CALIBRATING A COMBUSTION GAS ANALYZER

Vigo N. Smith, Saratoga, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Aug. 7, 1981, Ser. No. 291,154
Int. Cl.³ G01N *21/17*
U.S. Cl. 73—1 G **7 Claims**



1. A process for calibrating a computer-based combustion gas analyzer, said process comprising:

(a) sequentially introducing into and removing from the analyzer, members of a series of calibration gases each having a different, known concentration (C_i) of the combustion gas;

(b) generating a series of measurement values (R_i) to correspond, one to each known concentration (C_i) of combustion gas;

(c) determining the coefficients A_j in the equation:

$$R_i = \frac{1}{N} \sum_{j=1}^{N} \exp(-A_j C_i)$$

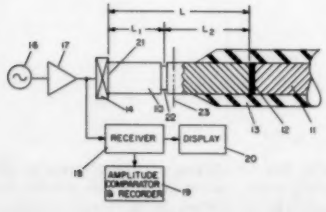
(d) entering the coefficients A_j into the computer of the analyzer.

4,445,360

METHOD FOR ULTRASONICALLY DETERMINING CHARACTERISTICS OF A BODY

Ralph A. Treder, Jr., Ewing, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,564
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—1 DV **1 Claim**



1. A method for remotely inspecting a brazed joint between a first elongated metal electrode and a second elongated metal electrode comprising the steps of:

generating ultrasonic signals into the metal electrodes by means of an ultrasonic transducer directly in contact with the first metal electrode;

forming a predetermined calibration notch substantially along the periphery of the first metal electrode at a predetermined distance from said transducer;

detecting two echo signals emanating from the electrodes, said echo signals consisting of a first ultrasonic signal reflected by said predetermined calibration notch and a second ultrasonic signal reflected by said joint; and

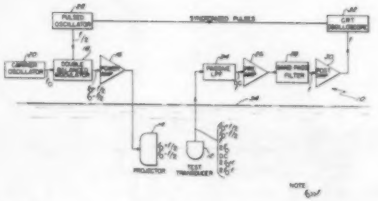
comparing said first and second detected signals thereby determining the quality of said joint independently of the transmission coefficient at the interface of the ultrasonic transducer and the first electrode.

4,445,361

SYSTEM FOR DETECTION OF TRANSDUCER DEFECTS

Mark B. Moffett, Waterford, and William L. Konrad, East Lyme, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 430,097
Int. Cl.³ H04B *13/00*; H04R *29/00*
U.S. Cl. 73—1 DV **7 Claims**



1. An apparatus for detecting defects in transducers under test, comprising:

frequency generating means for producing a synchronizing pulse and a dual-frequency signal at frequencies $f_o+f/2$ and $f_o-f/2$ where $f_o>>f/2$;

a projector, submerged in water and connected to said frequency generating means, for receiving said dual-frequency signal from said frequency generating means and projecting said dual-frequency signal a short distance through the water to said test transducer, said test transducer thereafter producing output frequencies $f_o+f/2$, $f_o-f/2$, $2f_o$, $2f_o+f$, $2f_o-f$, f, and a DC component in response thereto;

a linear, difference-frequency filtering means for receiving said output frequencies from said test transducer and producing as the output thereof only difference-frequency f; and

display means, connected to said difference-frequency filtering means and said frequency generating means, for receiving said difference-frequency f from said difference-frequency filtering means and said synchronizing pulse from said frequency generating means, and displaying said difference-frequency f thereon thus permitting observation and measurement of signal characteristics.

4,445,362

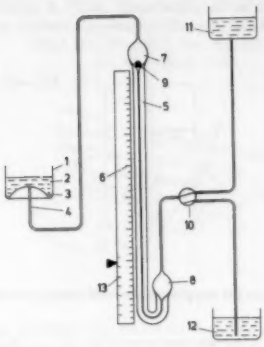
METHOD FOR MEASUREMENT OF THE CAVITY VOLUME OF SOFT CONTACT LENSES AND THE APPARATUS FOR THIS MEASURING METHOD

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Mar. 25, 1982, Ser. No. 361,828
Int. Cl.³ G01F *17/00*
U.S. Cl. 73—37.5 **12 Claims**

1. The method of measuring the cavity volume of a soft contact lens comprising the steps of immersing the contact lens

in a container of an aqueous media, causing said contact lens to freely rest on the bottom of said container within said media,



withdrawing the aqueous media from the area defined by the contact lens and the bottom of said container and thereafter measuring the amount of aqueous media thus withdrawn.

4,445,363

DEVICE FOR DETECTING FLOODING OF A HOLLOW STRUCTURE

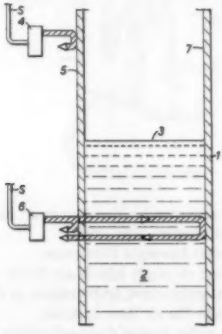
Alan Bennett, Fenham, and Derek Brown, Whitley Bay, both of England, assignors to British Gas Corporation, London, England

Filed Feb. 18, 1982, Ser. No. 349,984

Claims priority, application United Kingdom, Mar. 6, 1981, 8107122

Int. Cl.³ G01M *3/24*

U.S. Cl. 73—40.5 A **15 Claims**



1. An inspection device for detecting flooding of a hollow structural member, comprising an ultrasonic transducer for emitting a pulsed beam of ultrasonic sound, means for mounting said transducer to the structural member at a spacing therebetween so that the beam path is directed to pass through opposing spaced walls or wall portions of the member, and indicating means responsive to time-spaced echoes of the ultrasonic pulsed beam reflected respectively from said opposing walls or wall portions and received by said transducer to indicate the presence or absence of flooding in the member, said mounting means comprising alginment means for aligning the beam with the structural member thereby to optimise the amplitude of the first received one of said echoes.

4,445,364

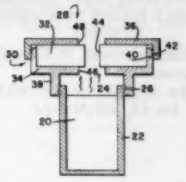
METHOD AND APPARATUS FOR MEASURING AIR INFILTRATION RATE INTO BUILDINGS

Lorin R. Stieff, Kensington, Md., and John C. Dempsey, Elliottville, N.Y., assignors to Taggents, Inc., Kensington, Md.

Filed Jan. 19, 1982, Ser. No. 340,589

Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **93 Claims**



1. Tracer emission apparatus adapted for use in a constant flow method for measuring air infiltration rate into an enclosure comprising;

a container,

tracer substance in the container, and

orifice means connected to the container for varying the diameter of an orifice in response to temperature in the vicinity of the container, said tracer substance escaping from the container through said orifice at a substantially constant rate independent of temperature in the vicinity of the container.

4,445,365

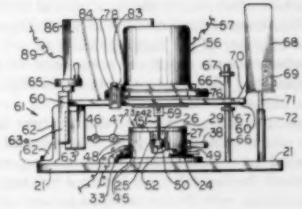
TAPERED BEARING SIMULATOR-VISCOMETER

Theodore W. Selby, 234 E. Larkin St., Midland, Mich. 48640

Filed May 17, 1982, Ser. No. 378,835

Int. Cl.³ G01N *11/14*

U.S. Cl. 73—60 **15 Claims**



1. An elevated temperature variable-gap rotational viscometer comprising

a thermally-conductive stator block embedded in thermal insulation and having an inverted frustoconical vertical bore, an inlet passage for admitting sample liquid axially into the bore at its bottom, and an overflow passage for sample liquid to leave the bore at its upper end;

a thermal sensor recessed in the block;

an element for heating the block responsive to the sensor;

a matching rotor extending axially downward into the stator bore to define therebetween a thin annular measuring gap, the rotor having a flexible drive shaft extending axially upward from it;

a multi-speed synchronous AC motor coaxial with and directly driving the shaft;

a turntable fixed to and supporting the motor and having a torque arm projecting therefrom,

the turntable being supported on a low-friction bearing resting on a cantilevered platform vertically adjustable by

a fine screw, and being restricted in rotation to a limited arc; and

a stationary force-measuring element opposing movement of the torque arm.

4,445,366

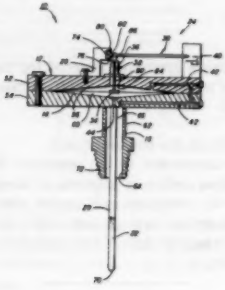
PRESSURE DIFFERENTIAL GAGE AND A METHOD FOR DETECTING THE PRESENCE OF NONCONDENSIBLE GASES IN A REFRIGERATION SYSTEM

Kenneth P. Gray, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,899

Int. Cl.³ G01N *7/14*

U.S. Cl. 73—64.2 **11 Claims**



1. A pressure differential gage comprising:

a housing defining first and second fluid passages;

a pressure sensitive diaphragm secured within and extending across the interior of the housing, and separating the housing interior into a first chamber in fluid communication with the first fluid passage and a second chamber in fluid communication with the second fluid passage;

a first tube connected to the housing, and having a first end in fluid communication with the first fluid passage and the first chamber of the housing, and a second end open to receive a sample vapor, the pressure of the sample vapor determining the vapor pressure in the first tube and the first chamber of the housing;

a connecting fitting secured to the first tube for connecting the pressure differential gage to an external body;

a second tube connected to the housing and extending through the first tube, and having a first end in fluid communication with the second fluid passage and the second chamber of the housing, and a closed second end;

a supply of reference fluid located in the second tube, the vapor pressure of the reference fluid determining the vapor pressure in the second tube and the second chamber of the housing; and

indicator means connected to the housing and actuated by the diaphragm to indicate when the vapor pressure in the first chamber of the housing differs from the vapor pressure in the second chamber of the housing.

4,445,367

HARDNESS TESTER

Hiroshi J. Goldsmid, Epping, Australia, assignor to Unisearch Limited, Kensington, Australia

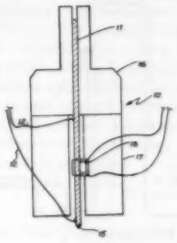
Filed Nov. 23, 1981, Ser. No. 323,911

Claims priority, application Australia, Nov. 25, 1980, PE6620; May 28, 1981, PE9073; Jul. 17, 1981, PE9787

Int. Cl.³ G01N *3/48*

U.S. Cl. 73—81 **22 Claims**

1. A thermal contact resistance hardness tester comprising a probe head of a relatively hard material so that the thermal contact resistance therebetween relates to the hardness of the



test material; means for supplying thermal energy to said probe head.

4,445,368

AIR FLOW RATE METER APPARATUS

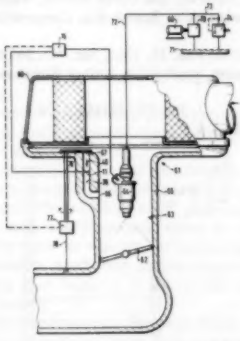
Jaihind S. Sumal, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,055

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130624

Int. Cl.³ G01F *1/68, 5/00*

U.S. Cl. 73—118.1 **5 Claims**



1. An air flow rate meter apparatus in an air intake of an internal combustion engine, comprising:

an air flow conduit having a restriction;

an air bypass line through which air flows which is at a predetermined proportion with respect to the mass of air flowing through the air flow conduit;

an air flow rate meter device disposed within the air bypass line, said air flow rate meter device including at least one temperature-dependent resistor, wherein:

at least one of temperature and resistance of said at least one temperature-dependent resistor is regulated in accordance with the mass of flowing air;

the air bypass line includes a mouth which opens into the air flow conduit at its restriction, closure means which prevents a flow of air through the air bypass line mouth toward said at least one temperature-dependent resistor and

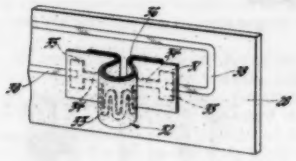
a servomotor adjustable by means dependent on negative pressure for actuating said closure means wherein the air bypass line is closeable at one of its ends by said closure means.

4,445,369

HOT FILM SENSOR FOR AIR FLOW METER

Donald D. Stoltman, Henrietta; Daniel F. Kabasin, Rochester, and Martin J. Field, Churchville, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1982, Ser. No. 437,038
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 6 Claims



1. In an air mass flow meter for measuring air flow moving substantially axially through a passage, a hot film sensor in the passage comprising:

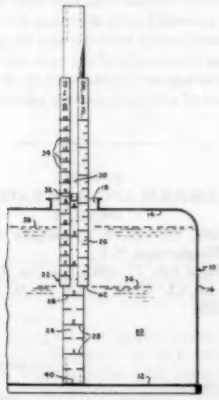
a support, a flexible insulating film having one surface dimension extending in the direction of the air flow and another surface dimension extending in a loop transversely of the passage, the film being attached at the ends of the loop to two spaced regions on the support, and a flexible resistance film supported on the looped insulating film whereby the resistance film describes a curved path extending transversely of the passage for intimate thermal coupling to the air flow.

4,445,370

OIL TO GASOLINE PROPORTIONING DEVICE FOR TWO CYCLE ENGINES

William E. Whitmire, Buckhead Ridge, Rte. 4, 118 20th St., Okeechobee, Fla. 33472

Filed Feb. 8, 1982, Ser. No. 346,905
Int. Cl.³ G01F 23/04
U.S. Cl. 73—290 B 3 Claims



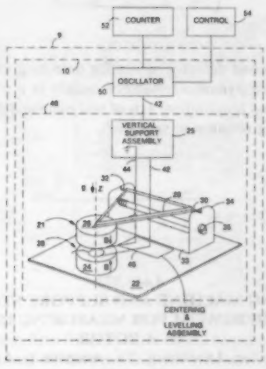
1. The method of determining the quantity of a second liquid to be added to a quantity of a first liquid to maintain a predetermined mixture ratio of the two liquids in a tank wherein a quantity of the first and second liquids having the desired mixture ratio is in the tank which comprises the steps of utilizing the first of a pair of relatively movable scale members to indicate the quantity of the first and second liquid mixture in the tank, aligning the end of the second of the pair of relatively movable scale members with the point on the first scale indicating the quantity of the mixture in the tank, adding a quantity of the first liquid in the tank and utilizing the second of the scale members to measure the quantity of the first liquid added to the contents of the tank and to indicating the quantity of the second liquid to be added to maintain the desired ratio.

4,445,371

GRAVITY METER AND METHOD

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 30, 1982, Ser. No. 373,327
Int. Cl.³ G01V 7/00
U.S. Cl. 73—382 R 10 Claims



1. Apparatus for determining the magnitude of the accleration of gravity at a location comprising:

a magnetic shield;

a temperature controlled housing;

a first magnet having a generally dipolar magnetic field;

a second magnet having a generally dipolar magnetic field;

support means for vertically supporting in a substantially vertical gravity field within the temperature controlled housing and within the magnetic shield the first magnet and the second magnet with opposed magnetic poles so as to form a magnetic vibrator;

first means for maintaining oscillation at a natural frequency of the magnetic vibrator formed by the first magnet and the second magnet in the substantially vertical gravity field, the natural frequency being representative of the acceleration of gravity at a location; and

second means responsive to said oscillation for generating a signal correlated to the natural frequency.

4,445,372

BALANCING MACHINE FOR BODIES OF ROTATION

Carlo Buzzi, Via Risorgimento, Mandello del Lario (Province of Como), Italy

Filed Feb. 9, 1982, Ser. No. 347,212
Int. Cl.³ G01M 1/16
U.S. Cl. 73—459 10 Claims

1. A machine for simultaneously detecting static and dynamic unbalance of rotary bodies, comprising a rigid stand member, at least one carrying member in the form of a resiliently flexible plate having at least one end thereof fixed to said stand member and a longitudinal axis extending transverse to said stand, a rotation shaft for mounting thereon a body to be balanced, a supporting structure rigid with said plate and arranged at a distance from said one end of said plate, said supporting structure having formations for rotatively accommodating said shaft with an axis of rotation for said shaft parallel to said plate, thereby a static unbalance of said rotary body causing in use mainly resilient lateral bending of said plate and

a dynamic unbalance of said rotary body causing in use mainly twisting of said plate about its longitudinal axis, first detector means for detecting vibrations generated by the static unbalance of said body mainly in the direction transverse to said

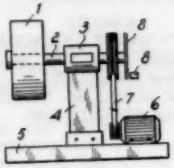


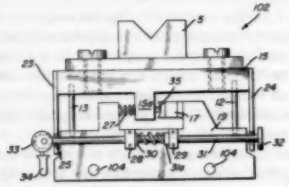
plate and second detector means for detecting vibrations generated by said dynamic unbalance mainly in a rotatory direction about said longitudinal axis of said plate and driving means for imparting rotation to said shaft.

4,445,373

BALANCING MACHINE AND SUPPORT STRUCTURES USABLE THEREWITH FOR MEASURING UNBALANCE IN A ROTOR

Richard Mueller, Lynchburg, Va., assignor to American Hofmann Corporation, Lynchburg, Va.

Filed Sep. 23, 1982, Ser. No. 422,285
Int. Cl.³ G01M *1/02*
U.S. Cl. 73—473 **4 Claims**



4. A support structure for use with a balancing machine comprising a pedestal; a yoke; means for interconnecting said pedestal and said yoke; and means for measuring forces acting on said yoke during measurement of unbalance of a rotating body,

said pedestal having a portion thereof shaped for guiding horizontal movement of said support structure with respect to a machine bed of a balancing machine and a portion thereof supporting said means for measuring forces;

said yoke comprising means for supporting bearings for a rotating body, means engageable with interconnection means of the balancing machine for interconnecting said yoke with another yoke, and means positioned in operative relationship with said means for measuring forces for transmitting forces acting on said yoke to said means for measuring forces;

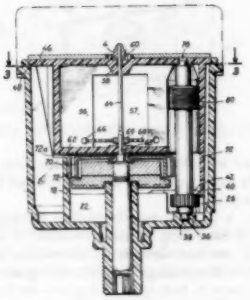
said means for interconnecting comprising a pair of round springs positioned between confronting surfaces of said yoke and said pedestal, a pair of flat springs carried by one of said yoke and said pedestal and selectively engageable with the other of said yoke and said pedestal, and means for selectively engaging said flat springs with the other of said yoke and said pedestal.

4,445,374

DISTANCE RECORDER FOR A TWO-WHEELED VEHICLE OR THE LIKE

Roger Huret, deceased, late of Nanterre, France, and by Alain P. B. Huret, heir, Bougival, France, assignors to Huret et SES Fils, Nanterre, France

Filed Mar. 4, 1982, Ser. No. 354,595
Claims priority, application France, Mar. 9, 1981, 81 04657
Int. Cl.³ G01P *1/02*
U.S. Cl. 73—490 **10 Claims**



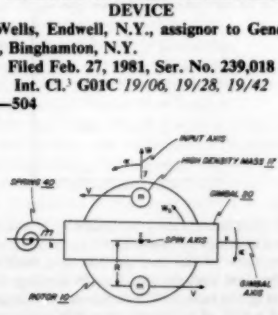
1. A recorder for a two-wheeled vehicle or the like, comprising a moulded cylindrical case having a longitudinally extending axis and a closed end wall, means defining a driving cable entrance in said end wall, and a mechanism support, the case having an inner surface which defines reinforcing ribs which extend longitudinally of the case and each terminate in an upper end which defines a bearing surface, said inner surface also defining at least two grooves extending longitudinally of the case, said mechanism support comprising a sheet which bears against said bearing surfaces at the upper ends of the ribs, closes the case and defines a centre aperture and at least one opening, the mechanism support further comprising two lateral flanges which depend from said sheet and fit exactly in the case and are provided with apertures for mounting shafts of counting means located between said flanges, and a partition wall extending diametrally of the case and carrying two bearings which bearings are coaxial with each other and with the center aperture of said sheet and are axially spaced apart from each other.

4,445,375

TUNED CORIOLIS ANGULAR RATE MEASURING DEVICE

Robert C. Wells, Endwell, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed Feb. 27, 1981, Ser. No. 239,018
Int. Cl.³ G01C *19/06, 19/28, 19/42*
U.S. Cl. 73—504 **3 Claims**



1. An angular rate measuring device comprising:

(a) a statically and dynamically balanced, unsymmetrical rotor including means for spinning the rotor about the

central axis thereof at a substantially constant high speed, the central axis thereby serving as the rotor spin axis;

(b) a gimbal rotatably securing the unsymmetrical rotor about the central axis thereof;

(c) a support base for rotatably coupling the gimbal about a gimbal axis perpendicular to the spin axis of the rotor, the gimbal axis being positioned to minimize gimbal inertia and static imbalance, the base including flexible means for coupling the gimbal to the base;

(d) an input axis perpendicular to the plane of the gimbal axis and the spin axis for receiving an input angular rate to be measured; and

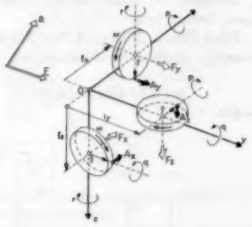
(e) means for sensing relative angular motion between the support base and gimbal, the relative angular motion being caused by torque being applied about the gimbal axis by oscillatory Coriolis forces being generated due to the input angular rate and the linear velocity of the spinnin gunsymmetrical rotor, the gimbal being tuned about the gimbal axis for increasing sensitivity to the generated Coriolis forces, the sensing means providing an output signal proportional to input angular rate, the means for sensing relative angular motion including a pair of piezoelectric crystals secured to the flexible coupling means at opposite sides thereof such that in the presence of relative angular motion between the gimbal and the support base, a first crystal will be in tension and a second crystal will be in compression, the outputs of the respective crystals being electrically connected in parallel for minimizing the effects of relative linear motion between the gimbal and the support base.

4,445,376

APPARATUS AND METHOD FOR MEASURING SPECIFIC FORCE AND ANGULAR RATE

Shmuel J. Merhav, Haifa, Israel, assignor to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Mar. 12, 1982, Ser. No. 357,714
Int. Cl.³ G01C *21/10*; G01P *15/08*
U.S. Cl. 73—510 **19 Claims**



1. Apparatus for measuring the specific force and angular rate of a moving body by means of a plurality of accelerometers mounted on mutually-perpendicular axes, characterized in that the apparatus includes:

(a) cyclic driving means for driving each accelerometer at a predetermined cyclic frequency "ω" to produce an output signal "a" from each accelerometer comprised of the angular rate vector "Ω" and the specific force vector "F,"

(b) means for deriving, from each of said accelerometer output signals "a," a signal corresponding to the angular rate vector "Ω" which means includes:

(1) multiplying means for multiplying said accelerometer output signal "a" by the function "sgn cos ωt" to produce the product signal "asgn cos ωt," and

(2) integrating means for integrating said product signal over the cyclic period; and

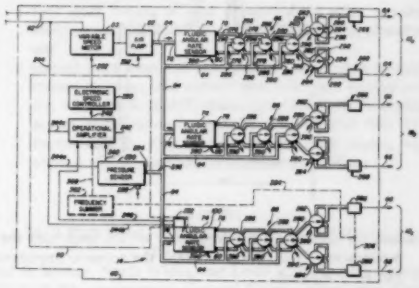
(c) means for deriving from each of said accelerometer output signals "a" a signal corresponding to the specific force vector "F," said latter means including integrating means for integrating said output signal "a" over the cyclic period.

4,445,377

PRESSURE-TO-ELECTRIC OUTPUT SYSTEM FOR AN ANGULAR RATE SENSOR OR THE LIKE

Thomas B. Tippetts, Mesa, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 12, 1980, Ser. No. 206,199
Int. Cl.³ G01P *15/00*
U.S. Cl. 73—516 LM **11 Claims**



1. An output system for use with a fluidic angular rate sensor of the type having a fluid jet and a pair of outlet passages for receiving portions of the jet to create in the outlet passages a duality of pressure signals having a relative pressure differential indicative of the rate and sense of rotation of the sensor about a control axis, said output system comprising:

(a) means for receiving and amplifying the pressure signals;

(b) means for receiving the amplified pressure signals and converting the same to a duality of pulsating pressure signals;

(c) means for receiving said pulsating pressure signals and converting the same to a duality of oscillating electrical signals having a relative frequency differential indicative of the rate and sense of rotation of the rate sensor about the control axis; and

(d) means for utilizing said oscillating electrical signals to generate a signal indicative of the pressure of the rate sensor jet.

4,445,378

ACOUSTIC GROUND IMPEDANCE METER

Allan J. Zuckerwar, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 24, 1982, Ser. No. 444,150
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—589 **9 Claims**

1. Apparatus for measuring the acoustic impedance of a surface over a continuous band of frequencies comprising:

a chamber having enclosed sides and first and second ends with the first end open and adapted to be fitted to said surface;

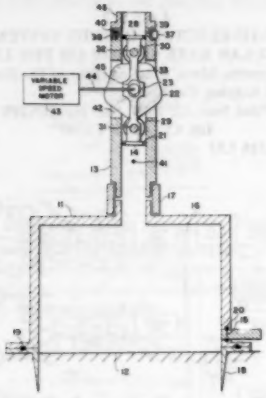
a neck having a smaller cross-sectional area than the ends of said chamber attached to said second end of said chamber such that the space inside said neck extends into the space inside said chamber wherein said chamber and said neck form a Helmholz resonator;

a piston inside said neck;

means for moving said piston back and forth inside said neck at selected frequencies;

means attached to a side of said chamber for measuring the

acoustic waves created inside said chamber by the back and forth movement of said piston; and



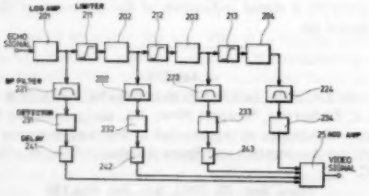
means for measuring the frequency of the back and forth movement of said piston whereby the acoustic impedance can be computed.

4,445,379

APPARATUS FOR RECEIVING REFLECTED ULTRASONIC WAVES IN ULTRASONOGRAPHY

Keiki Yamaguchi; Yasuhito Takeuchi; Shinichi Sano, and Takao Higashiizumi, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,736
Claims priority, application Japan, Mar. 4, 1982, 57-34364
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—631 **12 Claims**



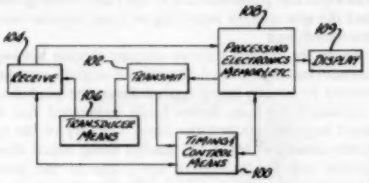
1. In an ultrasonographic system comprising means for emitting ultrasonic waves into a test body, said test body or parts thereof reflecting said ultrasonic waves as echo signals, apparatus for receiving said reflected echo signals, and means for displaying said echo signals as B-scan echograms; the improvement comprising said apparatus comprising a filter for processing said echo signals in response to instantaneous levels of said echo signals, so as to utilize higher frequency components of said echo signal when the instantaneous level of said echo signal is high, and so as to utilize lower frequency components of said echo signal when the instantaneous level of said echo signal is low, and also comprising means to detect said instantaneous level of said echo signal and to control said filter effectively on its partial or total contribution to said processing of of said echo signals.

4,445,380

SELECTABLE FOCUS SPHERICONE TRANSDUCER AND IMAGING APPARATUS

Perry Kaminski, Lewistown, Pa., assignor to Technicare Corporation, Solon, Ohio

Filed Jul. 21, 1982, Ser. No. 400,551
Int. Cl.³ G01N *29/00*; G10K *11/00*
U.S. Cl. 73—642 **13 Claims**



1. An ultrasonic transducer for use with an ultrasonic diagnostic system, comprising piezoelectric material exhibiting a radiating surface having a generally circular, concave shape with a center point, said radiating surface in cross-section resembling two symmetrical arcuate surfaces symmetrically disposed on either side of said center point and canted toward each other at an angle which is less than the angle traversed by a spherical surface of the same curvature as said arcuate surfaces and the same diameter as said effective radiating surface.

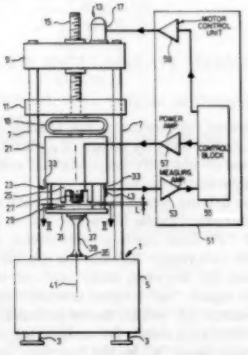
10. An ultrasonic transducer assembly for use with an ultrasonic diagnostic system, comprising a conical surface of piezoelectric material, and an acoustic lens affixed to said conical surface and having a spherical surface remote from said conical surface.

4,445,381

DEVICE FOR TESTING THE VIBRATION STRENGTH OF A TEST BODY

Max E. Russenberger, Bodman-Ludwigshafen, Fed. Rep. of Germany, assignor to Russenberger Prüfmaschinen AG, Schaffhausen, Switzerland

Filed Feb. 2, 1981, Ser. No. 230,897
Claims priority, application Switzerland, Feb. 11, 1980, 1065/80
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—666 **22 Claims**



1. A device for testing the vibration strength of a test body, comprising:

a framework;

holding elements to hold the test body on opposite sides thereof,

at least one vibration body operatively connected with one of said holding elements;

at least one uncoupling spring for decoupling said at least one vibration body and said one holding element connected therewith from the framework so that said at least one vibration body and said one holding element are able to vibrate;

at least one electromagnetic exciter having two parts that are movable in relation to one another for vibration excitation;

at least one elastic member;

supply means for supplying electrical energy to said at least one electromagnetic exciter, so that an oscillator comprising said at least one vibration body, said test body, and said at least one elastic member can be excited by said at least one electromagnetic exciter at its resonance frequency;

one portion of said elastic member being connected to one of said holding elements in such a substantially direct manner that said at least one vibration body has a mass greater than the total mass of said test body, said at least one elastic member and movable members arranged between said at least one elastic member and the test body to be held; and

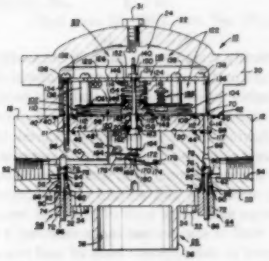
said two parts of said at least one electromagnetic exciter are bridged by said at least one elastic member.

4,445,382

DIFFERENTIAL PRESSURE-RESPONSIVE DEVICE

Louis E. Reynolds, Richardson, and Michael D. Beall, Garland, both of Tex., assignors to Reynolds Equipment Company, Garland, Tex.

Filed Oct. 23, 1981, Ser. No. 314,215
Int. Cl.³ G01L *13/02*
U.S. Cl. 73—716 **12 Claims**



1. A differential pressure-responsive apparatus comprising:

a primary base plate member;

a cover member detachably attached to a first surface of said primary base plate and thereby forming a normally closed chamber;

a first cavity formed in the first surface of said primary base plate within said closed chamber;

a second cavity formed in the bottom surface of said first cavity;

a bellows and range spring module operatively positioned in said first cavity and detachably attached to said primary base plate, said module comprising:

a secondary base plate member;

a bellows means with one end thereof detachably fixed to a surface of said secondary base plate member and having an opposite normally closed movable end thereof movable between extended and collapsed bellows positions in response to varying differential pressures thereacross, said bellows means dividing said chamber into separate inner and outer chamber portions communicating with the inner and outer sides, respectfully, of said bellows means;

means to operatively interconnect said inner chamber portion and said second cavity;

a first normally closed, one-way-opening valve means in said normally closed movable end of said bellows means, operable for interconnecting and disconnecting said inner and outer chamber portions when said first valve means is opened and closed respectfully, said first valve means moving with said movable end of said bellow means when in said closed position, whereby said bellows and range spring module is accessible for removal from said apparatus upon removing only said cover member;

first and second connector ports formed in said primary base plate member;

a first duct means in said primary base plate member interconnecting said first port with said outer chamber; and

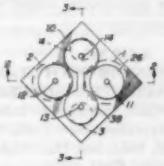
a second duct means in said primary base plate member interconnecting said second port with said second cavity, whereby such differential pressures may be applied across said bellows means by way of said first duct means and by way of said second duct means, said second cavity and said interconnecting means.

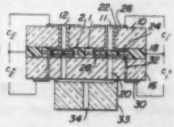
4,445,383

MULTIPLE RANGE CAPACITIVE PRESSURE TRANSDUCER

Paul B. Binder, North Wales, and Louis D. Di Napoli, Colmar, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Jun. 18, 1982, Ser. No. 389,657
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—718 **8 Claims**





1. A multi-range, variable capacitance pressure transducer, comprising:

a pair of plates of non-conductive material;

a diaphragm plate bonded between the plates of said pair, said diaphragm plate having a plurality of conductive deflecting areas of different diameters defined by cavities on opposite sides of said diaphragm plate;

conducting areas deposited on the plates of said pair opposite the deflecting areas to form capacitors therewith;

means providing fluid communication to the cavities so that opposing sides of the deflecting areas are exposed to fluid pressures to be measured; and

means providing electrical connection to the conducting areas and said conductive deflecting areas of said diaphragm plate so that selected combinations of the capacitors formed between said conducting areas and associated conductive deflecting areas are connected to provide the same capacitance and capacitance change for pressure

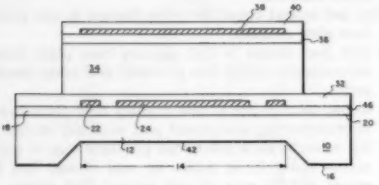
difference measurements of said fluid over different ranges.

4,445,384

PIEZOELECTRIC PRESSURE SENSOR

Michele Royer, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 30, 1982, Ser. No. 363,693
Int. Cl.³ G01L 9/08, 9/12
U.S. Cl. 73—724 **11 Claims**



1. A pressure sensor comprising:

piezoelectric means comprising a piezoelectric material for providing a piezoelectric output signal when subjected to a pressure and for providing an undesirable pyroelectric output signal, the piezoelectric means having first and second surfaces; and

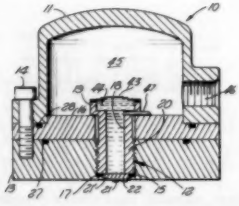
electrode means comprising a first contact covering at least a portion of the first surface, the electrode means further comprising a pair of contacts covering a portion of the second surface, the contacts having a geometry for enhancing the piezoelectric output signal and for substantially eliminating the pyroelectric output signal.

4,445,385

STATIC PRESSURE SENSOR WITH GLASS BONDED STRAIN GAUGE TRANSDUCERS

Teruyuki Endo, Covina, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,405
Int. Cl.³ G01L 9/04
U.S. Cl. 73—726 **1 Claim**



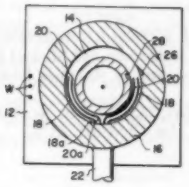
1. A transmitter comprising: a fluid housing having a wall; a fitting including an externally threaded hollow shank forming a cylindrical passageway about a central axis therein, said shank having a circular disc centered perpendicularly about said passageway axis, said disc being welded to said shank covering one end of said passageway, said fitting being threaded into and sealed in a fixed position in said wall, a central portion of said disc expanding outwardly of said housing when a fluid is held therein at a pressure inside said passageway higher than that on the outside of said disc; first and second strain gauges glass bonded to the same outside surface of said disc in positions to increase and to decrease in resistance as said disc expands outwardly, said first strain gauge being transversely and longitudinally centered symmetrically on a diametral line through the center of said central portion, said second strain gauge being transversely centered on the same said diametral line but longitudinally spaced from said first strain gauge; and means connected from said first and second strain gauges to produce an electrical output signal which is a first function of the resistances of said first and second strain gauges, said first function being a second function of the pressure within said passageway, each of said first and second strain gauges being approximately the same size, rectangular in top and bottom plan, substantially uniform in thickness, and glass bonded to the external circular surface of said disc, the center of said first strain gauge lying on the axis of said passageway, the longitudinal axis of said first strain gauge being the same as that of said second strain gauge, a line normal to said circular disc surface through the center of said second strain gauge being tangent to the cylindrical surface of said passageway.

4,445,386

HERMETICALLY SEALED HIGH TEMPERATURE STRAIN GAGE

John M. Nielsen, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 8, 1982, Ser. No. 356,054
Int. Cl.³ G01B 7/16
U.S. Cl. 73—780 **10 Claims**



2. A hermetically sealed strain gage for measuring strains of high temperature parts, comprising an attachment shim plate, a first inner member having one end sealingly secured to said shim plate, a second outer member disposed over said inner member and having one end sealingly secured to said shim plate, said second outer member having an outer wall and said outer member having an inner wall spaced from said first inner member outer wall, first and second spaced capacitor plates disposed between said outer wall of said first innner member and said inner wall of said second outer member, a cover plate sealingly secured to the opposite ends of said inner and outer members closing the space between said inner and outer members, and sensing means associated with said capacitor plates responsive to change of movement of said plates to indicate stress of the part.

4,445,387

COMPRESSION SHEAR TEST JIG

Henry J. Hall, Arden Hills, and John G. Haygreen, Roseville, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

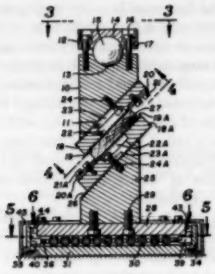
Filed Jun. 17, 1982, Ser. No. 389,292
Int. Cl.³ G01N 3/24
U.S. Cl. 73—845 **16 Claims**

1. A compression shear test jig for determining the internal strength of wood fiberboard and particleboard, said jig comprising:

(a) an upper loading head including a body having a bottom sample engaging face, said face being disposed at substantially a 45° angle from horizontal, said face having a sample restraining element at its upper end,

(b) a lower loading head disposed immediately below said upper head and including a body having a top sample engaging face, said face being disposed at substantially a

45° angle from horizontal, spaced from and substantially parallel to the bottom face of the upper head, said top face having a sample restraining element at its lower end, a wood fiberboard or particleboard sample being supportable on the face of the lower head in engagement with the sample restraining element, and the upper head being



supportable on the sample, the sample restaining element of the upper head being in engagement with the sample, and

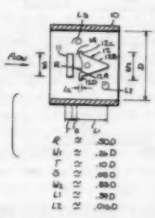
(c) a horizontal minimum friction surface supporting said lower loading head to permit easy relative horizontal movement of the lower head thereon.

4,445,388

DUAL-BODY VORTEX-SHEDDING FLOWMETER

Peter J. Herzl, Morrisville, and Warren O. Strohmeier, Warminster, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 28, 1982, Ser. No. 392,669
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.24 **9 Claims**



1. A vortex-shedding flowmeter for measuring the flow rate of fluids, said flowmeter comprising:

A. A flow tube through which flows the fluid stream to be metered, said tube having a longitudinal flow axis;

B. a dual-body shedder disposed in said tube symmetrically with respect to said flow axis, said shedder having a front section fixedly mounted across the tube, the long axis of the front section being normal to the flow axis, and a fluid-impermeable rear section behind the front section and independent thereof to define therewith an obstacle-free gap configured to produce a fluidic feedback path so that a strong hydraulic interaction takes place between the sections, the width of said gap being small relative to the width of the front section, both of which divide the fluid stream and contribute to the formation of periodic vortices which are alternately generated on either side of the dual-body shedder;

C. a shaft pivotally supporting said rear section on a pivot axis parallel to said long axis and normal to said flow axis, whereby said vortices induce oscillations in the rear section at a frequency depending on flow rate; and

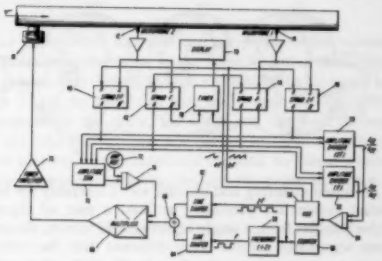
D. a torsion sensor operatively coupled to the shaft to convert the oscillations into a signal representing the flow rate.

4,445,389

LONG WAVELENGTH ACOUSTIC FLOWMETER

James E. Potzick, Potomac, and Baldwin Robertson, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 300,830
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.27 **22 Claims**



16. An instrument for producing sound waves of a specified wavelength in an arbitrary fluid in a conduit having a cutoff wavelength, said instrument comprising:

means, responsive to an input signal, for producing sound waves in said fluid of at least one wavelength, said at least one wavelength being longer than said cutoff wavelength of said conduit;

first means for receiving said sound waves;

second means for receiving said sound waves, said second receiving means located a distance, in a direction of sound propagation, from said first receiving means;

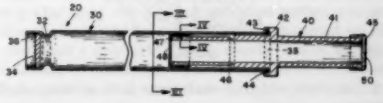
means, responsive to said first and second receiving means, for producing said input signal of a frequency such that said distance is an integral number of half wavelengths of said specified wavelength, wherein said input signal producing means includes means, responsive to said first and second receiving means, for controlling the average amplitude of sound waves from said sound wave producing means.

4,445,390

SAMPLING TUBE AND APPARATUS

William L. Atwell, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Dec. 2, 1982, Ser. No. 446,186
Int. Cl.³ G01N *1/12, 1/24*
U.S. Cl. 73—864.52 **20 Claims**



1. A molten metal sampling device comprising:

an outer cylindrical tube sealably enclosed at one end and open at an opposite end; and

a cylindrical sampling tube coaxially and sealably fitted at least partially within said opposite end of said outer tube and having an extending end sealed with a fusible material and an opposite end positioned within said outer tube and including closure means for blocking the flow of molten

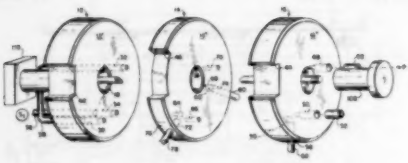
metal into said outer tube while permitting reverse direction flow of gases therein, and wherein the interior of said outer and sampling tube is evacuated to a negative pressure.

4,445,391

LIQUID METERING AND TRANSFER VALVE ASSEMBLY

Pedro P. Cabrera, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Oct. 19, 1981, Ser. No. 312,218
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—864.12 **14 Claims**



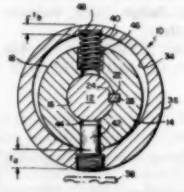
1. A liquid metering and transfer valve assembly for use in a diluting system for providing at least a pair of segmented precise samples from a single liquid sample source, the volume of one segmented sample being different than the volume of the other segmented sample of said pair, said valve assembly being operable between a load and a delivery condition and comprising means defining a first and second segmenting portion in series communication for receiving a continuous volume of sample from said source, means for isolating the contents of said first and second segmenting portions one from the other and means for combining each of said first and second isolated contents with a precise volume of diluent and delivering said isolated contents with their associated amount of diluent to respectively different preselected exterior locations, said first segmenting portion comprising internal segmenting passageway means having a precise internal volume and said second segmenting portion comprising an external hollow loop having a precise internal volume different from the volume of the segmenting passageway means.

4,445,392

OVERSPEED TRIP MECHANISM

Prem Pratap, Holden, Mass., assignor to Coppus Engineering Corporation, Worcester, Mass.

Filed Jan. 18, 1982, Ser. No. 340,197
Int. Cl.³ F16H *5/42;* **G05G** *17/00*
U.S. Cl. 74—3 **6 Claims**



1. An overspeed trip mechanism for a rotating shaft, comprising:

a collar having a cylindrical first axial bore arranged concentrically with respect to a cylindrical first external surface, said collar being arranged to be received coaxially on the shaft;

means for fixing said collar relative to the shaft for rotation therewith;

a ring surrounding and connected to said collar for rotation therewith, said ring having a cylindrical second axial bore and a cylindrical second external surface, the diameter of said second axial bore being greater than the diameter of said first external surface, said second axial bore being arranged eccentrically with respect to said second external surface to define diametrically opposed maximum and minimum ring wall thickness;

a trip member arranged exteriorly of said ring;

resilient means arranged between said ring and said collar on one side of said first axial bore for urging said ring radially in one direction into a first position at which said second external surface is spaced radially from said trip member and arranged concentrically with respect to said first axial bore and the shaft axis, said resilient means being adapted to yield to a selected level of centrifugal force developed during rotation of said ring and collar with the shaft and to accommodate a radial shifting of said ring relative to said collar in a direction opposite to said one direction to a second position at which said second external surface contacts said trip member; and

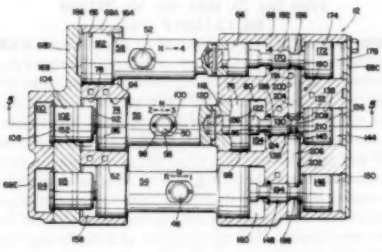
guide means for radially directing the movement of said ring relative to said collar between said first and second positions, said guide means comprising a first radial bore in said collar and a pin member protruding radially inwardly from said ring to be slidably received in said first radial bore, said resilient means comprising a compression spring received in a second radial bore in said collar and protruding therefrom into contact with the interior of said ring.

4,445,393

FLUID ACTUATED SHIFT BAR HOUSING ASSEMBLY

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 18, 1982, Ser. No. 340,151
Int. Cl.³ G05G *9/12;* **F16D** *25/08;* **F15B** *15/17*
U.S. Cl. 74—346 **18 Claims**



1. A pressurized fluid operated shift bar housing assembly for a change gear transmission, said assembly comprising:

a shift bar housing having an axially extending bore therein;

a shift bar slidably received in said bore, said shift bar having a first axial position and a second axial position relative to said housing;

a shift fork associated with said shift bar, said shift fork associated with a transmission gear engaging clutch member and effective to hold said clutch member disengaged in the first axial position of said shift bar and effective to cause engagement of said clutch member in the second axial position of said shift bar;

a first constantly pressurized fluid chamber defined by said housing, a first piston slidably and sealingly received in said first chamber, said first piston acted upon by pressurized fluid in said first chamber for applying a first axially directed force on said shift bar when said shift bar is axially displaced from said first axial position tending to bias said shift bar toward said first axial position;

a second selectively pressurized fluid chamber defined by said housing, a second piston slidably and sealingly received in said second chamber, pressurization of said

second chamber effective to cause said second piston to move said shift bar to said second axial position with a second axial force greater than and oppositely directed relative to said first axial force;

valve means connectable to a source of pressurized fluid for constantly pressurizing said first chamber and for selectively pressurizing and exhausting said second chamber; and

a detent mechanism effective to apply a resilient detent force to said shift bar in the second axial position thereof, said resilient detent force resisting axial movement of said shift bar, said resilient detent force having an axial component smaller than the magnitude of said first axial force.

4,445,394

CONTROL LEVER ARRANGEMENTS

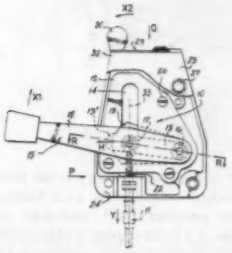
Robert E. Yapp, Chillington, and Derek J. Smith, Curdworth, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Aug. 31, 1981, Ser. No. 297,886

Claims priority, application United Kingdom, Sep. 6, 1980, 8028849

Int. Cl.³ F16C 1/10

U.S. Cl. 74—501 R **2 Claims**



1. A control lever arrangement for longitudinally moving an actuating member along a line of action between first and second positions, the arrangement comprising a cam means with first and second mutually inclined portions, a control lever operatively connected with the actuating member and pivotally moveable between first and second stable lever positions corresponding to the first and second positions respectively of the actuating member, the control lever having a handle portion at one end and being mounted for said pivotal movement via a follower which engages the first portion of the cam means and by a guidance means which engages the second portion of the cam means, the arrangement being such that as the lever is pivoted from its first to its second position to longitudinally displace the actuating member, the guidance means moves along the second portion of the cam means and the follower moves along the first portion of the cam means so that the point of contact of the follower with the first portion of the cam means moves towards the line of action of the actuating member whereby the mechanical advantage of the lever increases, the lever also going overcenter thus executing a toggle action between its first and second stable positions.

4,445,395

APPARATUS FOR MEASUREMENT OF ICE MOVEMENT

Wayne C. Beckman, and Patrick E. Harwell, both of Santa Barbara, Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Oct. 30, 1981, Ser. No. 316,769

Int. Cl.³ F16C 1/10

U.S. Cl. 74—501 R **4 Claims**

1. A guide structure for affording axial movement of a cable therethrough, the guide structure comprising a guide tube having an inner diameter greater than the outer diameter of the cable and a seal carried by each end of the tube for intimately and slidably cooperating with the outer surface of the cable disposable through the guide structure, each seal including an inner cylindrical component having an inside diameter substantially equal to the diameter of the cable, and the inner component being secured to an outer cylindrical component having an inner diameter substantially equal to the outer diameter of

the inner component, and said outer component has an outer diameter substantially equal to the inner diameter of the guide tube and is secured therein to form a substantially oil-proof seal through which the cable can pass, and a quantity of lubricant compatible with the cable, the tube, and the seals disposed within the tube and substantially filling the same between the seals for lubricating the cable and the seals to thereby enable the cable to move lengthwise through the guide structure.

4,445,396

HANDLEBAR FOR A BICYCLE

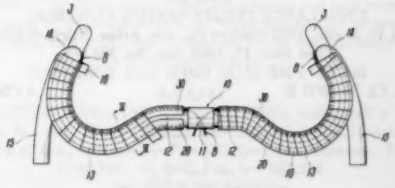
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 2, 1981, Ser. No. 239,537

Claims priority, application Japan, Mar. 6, 1980, 55-30114[U]

Int. Cl.³ B62K 21/12

U.S. Cl. 74—551.1 **5 Claims**



1. A bicycle handlebar for mounting on a handle stem of a bicycle receiving at an end a control lever, said handlebar comprising a bar body which has at its central portion a mounting portion through which said handlebar is mounted on said handle stem, and a pair of attaching members each having a concave surface of a circular arc cross section to fit an outer periphery of said bar body and each being formed to have a semielliptical cross section, each of said attaching members extending from said mounting portion along said bar body toward an end thereof, and being fixed to the outer periphery of said bar body along a rear side thereof in a forward moving direction of the bicycle, so that said concave surface thereof contacts with the rear side, at least one of said attaching members having an insertion bore extending along its entire longitudinal extent for housing a control wire extending from said control lever and along said bar body.

4,445,397
FOOT CONFORMING PEDAL FOR A BICYCLE

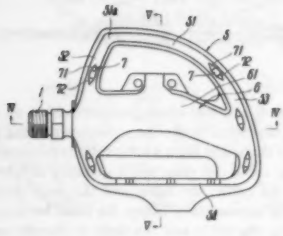
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 17, 1981, Ser. No. 293,093

Claims priority, application Japan, Aug. 25, 1980, 55-121009[U]; Aug. 25, 1980, 55-121010[U]; Aug. 25, 1980, 55-121011[U]; Sep. 19, 1980, 55-134346[U]

Int. Cl.³ G05G 1/14

U.S. Cl. 74—560 **6 Claims**



1. A pedal for a bicycle comprising a pedal shaft and a pedal body supported rotatable to said pedal shaft and having a shaft bore, said pedal body comprising a first foot bearing body having a frame-like shape and a front foot bearing surface, a rear foot bearing surface, and left-hand and right-hand foot bearing surfaces, said left-hand and right-hand foot bearing surfaces being curved around axes which are parallel to an axis of said pedal shaft; and a second foot bearing body having a middle foot bearing surface positioned at a longitudinally intermediate portion between said front foot bearing surface and said rear foot bearing surface and in continuation of said left-hand and right-hand foot bearing surfaces, said middle foot bearing surface being displaced toward the axis of said pedal shaft with respect to said front and rear foot bearing surfaces; said first and second foot bearing bodies being displaced radially upwardly on one side of the axis of said pedal shaft, said pedal body having a pair of support walls at opposite lateral sides of each of the first and second foot bearing bodies, and reflectors located between said support walls.

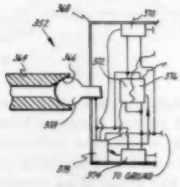
4,445,398
UNBALANCE COMPENSATOR CONTROL

Jack H. Kerlin, 1722 Sanford Pl., Ann Arbor, Mich. 48103

Filed Mar. 17, 1982, Ser. No. 358,999

Int. Cl.³ F16F 15/22; G01M 1/16; B24B 41/00

U.S. Cl. 74—573 R **4 Claims**



1. In a machine having a rotary mass requiring balancing, an unbalance compensator comprising a rotary portion adapted to be mounted on the rotary mass requiring balancing, balancing mass means on the rotary portion, distribution means for distributing the balance mass means on the rotary portion so as to correct for imbalance, and control means for the distribution means, the improvement in said control means which comprises a first contact on the unbalance compensator concentric with the axis of rotation of the rotary mass, a second contact stationarily arranged and biased against said first contact, a third contact on the rotary balance mass concentric with the axis of rotation and a fourth contact stationarily arranged and biased against the third contact, means for applying a composite waveform across the two stationary contacts with the waveform containing power and signal components, means coupling the first and third contacts with the distribution means comprising means responsive to the signal component of the composite waveform for controlling distribution of the balance mass means through the appropriate application of the power component of the composite waveform to the balance mass means.

4,445,399
PROCESS FOR BALANCING A CRANKSHAFT

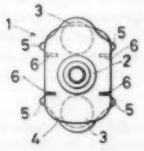
Takeshi Sasaki, Tokorozawa; Kiyoshi Akiba, Hidaka, and Yoshio Takahashi, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 100,218, Dec. 4, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 289,311

Claims priority, application Japan, Dec. 11, 1978, 53-151934

Int. Cl.³ B23K 1/20, 27/00

U.S. Cl. 74—603 **4 Claims**



1. In a crankshaft of the type having journal parts, eccentric pin parts, and balancing weight parts, each balancing weight part having an outer periphery said crankshaft being specifically intended for use in a weld-deposit method of final balancing of the crankshaft which includes depositing pads of weld metal on specific sites of the balancing weight parts in a manner known per se;

the improvement comprising each said balancing weight part having a recess extending radially inwardly from said outer periphery at a location intermediate said weld-deposit site and an adjacent journal of the crankshaft, said recess defining a complete air gap and effecting an increase in length of the thermal transmission path between said weld-deposit site and said adjacent journal.

4,445,400
DIFFERENTIAL SPEED LIMITING DEVICE

William C. Sullivan, Newark, Ohio, and Spencer M. Nimberger, Houston, Tex., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 28, 1981, Ser. No. 306,052

Int. Cl.³ F16H 1/44

U.S. Cl. 74—711 **22 Claims**

1. A differential speed limiting device for limiting the relative rotational speed between a first member and a second member capable of independent rotation about a common axis of rotation, said differential speed limiting device comprising:

first and second friction disc means respectively mounted for rotation with said first and said second members and capable of being compressed axially to generate frictional contact therebetween tending to reduce said relative rotational speed between said first and said second members;

an annular housing mounted for rotation with said first member;

an annular bellows means mounted on said housing and having an extended end aligned with said first and said second friction disc means, said extended end being capable of axial movement toward and away from said first

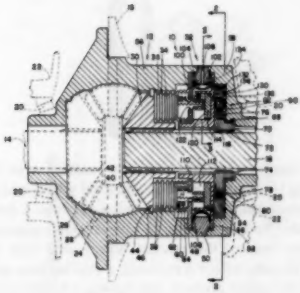
and said second friction disc means when a primary pressure of fluid within said bellows means is respectively increased and decreased;

said housing including therein a force multiplier having an input end capable of having an intermediate pressure of said fluid acting thereon and an output end which produces said primary pressure of said fluid within said bellows means, said primary pressure being directly proportional to and larger than said intermediate pressure;

said housing having a pump portion which includes an interior cylindrical surface located therein;

a length of collapsible tubing means having a first end and a second end and being formed into a single loop about said interior cylindrical surface, said loop lying in a plane which is normal to said common axis;

planetary roller means mounted in said plane for rotation with said second member and in frictional surface contact with said tubing means, said roller means being of such radial dimensions as to compress said tubing means against said interior cylindrical surface in a region of said contact;



said housing having a reservior for said fluid therein;

a first passage means for said fluid between said reservior and said first end of said tubing means;

a second passage means for said fluid between said second end of said tubing means and said input end of said force multiplier;

said second member rotating in a first direction relative to said first member causing said roller means to circumferentially travel along said tubing means from said first end to said second end to produce peristaltic pumping of said fluid from said reservior through said first passage means, said tubing means, and said second passage means to said input end of said force multiplier to produce said intermediate pressure fo said fluid therein; and

means for discharging said fluid from said input end of said force multiplier to said reservior to reduce said intermediate pressure of said fluid at said input end of said force multiplier when there is no rotation of said second member relative to said first member.

4,445,401

GEAR SHIFT SHOCK REDUCING APPARATUS FOR HYDRAULIC CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

Wataru Ishimaru, No. 3-5-19, Ikego, Zushi City, Japan

Filed Oct. 10, 1980, Ser. No. 195,738

Claims priority, application Japan, Oct. 15, 1979, 54-131739

Int. Cl.[3] B60K *41/06, 41/10*

U.S. Cl. 74—869 **8 Claims**

1. A gear shift shock reducing apparatus of a hydraulic control system for an automatic transmission including a driving member operatively connected to the output shaft of an engine of an automotive vehicle, a driven member, and frictional units having fluid operated actuating means selectively made operative and inoperative for producing a plurality of gear ratios between the driving and driven members, comprising:

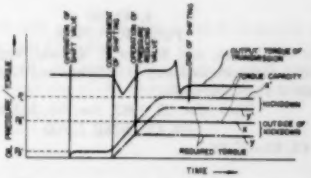
means for generating a line fluid pressure;

means for generating a kickdown fluid pressure under a kickdown condition;

a manual valve provided operatively between said line fluid pressure generating means and the respective fluid operated actuating means of the frictional units;

a shift valve provided operatively between said manual valve and at least one of the fluid operated actuating means of the frictional units, said shift valve having a valve spool movable into a position providing communication between said line fluid pressure generating means through said manual valve and said at least one of the fluid operated actuating means; and

a pressure reducing valve provided operatively between said at least one of the fluid operated actuating means and said manual valve and having a valve member movable into a



position providing communication between said at least one of the fluid operated actuating means and said manual valve through said shift valve, said pressure reducing valve communicating with said kickdown fluid pressure generating means for producing an actuating fluid pressure which is not higher than said line fluid pressure in response to the absence of said kickdown fluid pressure, said valve member of said fluid pressure reducing valve including a first pressure-acting area which is selectively exposed to said actuating said pressure to which said at least one of the fluid operated actuating means is selectively exposed and a second pressure-acting area, opposite to said first pressure-acting area, which is selectively exposed to said kickdown fluid pressure, said valve member of said pressure reducing valve being held in said position providing communication between said at least one of the fluid operated actuating means and said manual valve through said shift valve when said second pressure-acting area is exposed to said kickdown fluid pressure.

4,445,402

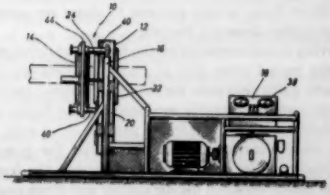
POWER TONG AND BACK-UP TONG ASSEMBLY

Garth M. Farr, Kingwood, and Patrick R. Callihan, Houston, both of Tex., assignors to Farr Oil Tool, Inc., Houston, Tex.

Filed Feb. 25, 1982, Ser. No. 352,244

Int. Cl.[3] B25B *17/00*

U.S. Cl. 81—57.16 **18 Claims**



1. An assembly for threadably joining or disjoining tubular members comprising:

a first tong adapted to receive and rotate a first tubular member in a first direction, said first tong being of the type

having a rotatable cam surface and a jaw assembly disposed between the cam surface and such a first tubular member in a manner that rotation of the cam surface acts to bring the jaw assembly into a gripping relationship with, and thereby rotate such a first tubular member;

a second tong adapted to receive and hold a second tubular member in a fixed position relative to a first tubular member, said second tong comprising:

a fixed cam ring having a cam surface, said cam ring being axially aligned with the rotatable cam surface of the first tong;

a second jaw assembly rotatable in said first direction which acts against the cam surface of the fixed cam ring so as to be urged into a gripping relationship with such a second tubular member; and

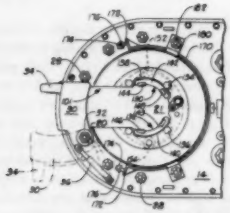
means for rotating the second jaw assembly until an initial gripping relationship is achieved with such a second tubular member.

4,445,403

POWER TONGS

Harlo W. Janzen, and Melvin J. Kliewer, both of Fairview, Okla., assignors to Larry D. Kliewer and Glenn A. Kliewer, both of Fairview, Okla.

Filed Mar. 29, 1982, Ser. No. 362,897
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.18 **22 Claims**



1. A power tong for gripping a pipe section to make up or break a threaded connection between pipe sections comprising:

a frame having a central opening therethrough, and a pipe-receiving throat opening at one side of the frame into the central opening;

a partial drive ring rotatably mounted on said frame and defining an opening at one side thereof adapted for alignment with said throat in one position during rotation;

a pair of arcuate bearing and guide segments mounted on said frame at opposite sides of said drive ring and each defining a raceway recess receiving and slidably supporting an outer peripheral portion of said drive ring, each of said bearing and guide segments having a generally rectangular cross-section, with said recess located at the concave, radially inner side thereof, and each of said segments being of a solid molded or cast polyurethane having from about three weight percent to about ten weight percent graphite dispersed therein;

driving means mounted on the frame and drivingly engaging the partial drive ring at a location between said bearing and guide segments for driving the drive ring in rotation;

a die carrier rotatably mounted on the frame for rotation relative to both the frame and the drive ring;

die means carried on the die carrier for gripping a pipe placed in the central opening through the frame; and

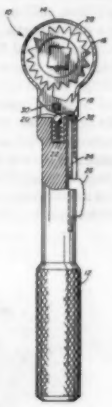
cam means between the die carrier and drive ring for actuating the die means into engagement with a pipe in said central opening upon partial rotation of the drive ring, and thereafter engaging said ring and die carrier with each other for concurrent rotation.

4,445,404

REVERSIBLE RATCHET WRENCH

David L. Parker, Nogales, Ariz., assignor to Bob Barber, Jr., Tucson, Ariz., a part interest

Filed Dec. 9, 1981, Ser. No. 328,931
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—62 **1 Claim**



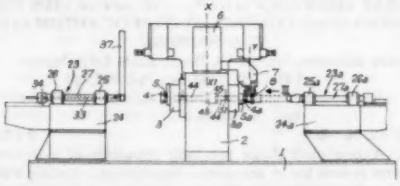
1. An improvement in reversible ratchet wrenches of the type having in its upper portion a ratchet wheel attached to the square shaped stud adapted to receive a socket, a double ended spring loaded ratchet reversing pivotal pawl adapted to pivot and thereby engage the ratchet wheel with one end or the other and thereby effect a reversal, a mid-section portion connecting to the upper portion, and having a handle to be held by the operator's hand connecting to the mid-section, the improvement comprising an extension rod pivotally connected at one end to the pivotal pawl and a direction reversing push-button assembly penetrating transversely the mid-section portion proximate the handle, said push-button assembly defining a ramp engaged by said extension rod second end, said ramp further including a notch situated mid-range, said notch adapted to be engaged by said extension rod mid-way in said extension rod's linear travel between reversing positions in order to effect a neutral position of the pivotal pawl not engaging the ratchet whereby the operator may reverse the ratchet direction with the same hand maintaining a grip on the handle.

4,445,405

LATHES WITH CENTRAL HEADSTOCK

Marcel Champeau, Niort, and Andre Tabutin, La Celle-Saint-Cloud, both of France, assignors to Ramo S.A., France

Filed Dec. 3, 1981, Ser. No. 327,086
Claims priority, application France, Dec. 11, 1980, 80 26336
Int. Cl.³ B23B *15/00*
U.S. Cl. 82—2.5 **8 Claims**



1. A workpiece transfer apparatus for a lathe with a headstock having two clamping chucks mounted on opposite sides

of the headstock for rotation about a common axis, the transfer apparatus comprising:

transfer means pivotally mounted to the headstock for transferring a workpiece from one clamping chuck to the other clamping chuck; and

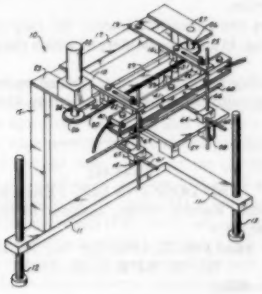
injecting means disposed co-axially with said one clamping chuck for transferring a workpiece from a workpiece loading station into said one clamping chuck and ejecting means disposed co-axially with said other clamping chuck for transferring a workpiece from said other clamping chuck to a workpiece unloading station.

4,445,406

SPIN TRIMMER FOR REMOVING FLASHING FROM THE TOPS OF PLASTIC BOTTLES

Alan J. Thatcher, 9386 La Gloria Dr., Alta Loma, Calif. 91701

Filed Sep. 29, 1982, Ser. No. 428,406
Int. Cl.³ B23B *3/04, 5/14*
U.S. Cl. 82—46 **6 Claims**



1. A spin trimmer for making a smooth cut at the top of a blow molded hollow plastic object such as a bottle, said spin trimmer comprising:

a support frame;

a drive belt support bar affixed to said frame;

a moveable belt positioned against the support bar, said belt having drive means for moving the belt against the support bar;

a bottle dome support bar having at least two grooves formed longitudinally therealong, said bottle dome support bar being supported by said frame and being held parallel to the drive belt support bar and positioned so that the upper groove is above the central axis of the moveable belt and the lower groove is below the central axis of the belt; and

horizontally positioned knife means held below said support bar and projecting in the direction of the drive belt support bar said knife means being heated to a temperature sufficient to soften the plastic material from which the object is blown.

4,445,407

METHOD AND APPARATUS FOR HANDLING BOOK TRIMMINGS

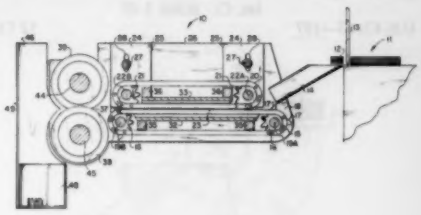
Anton V. Lucas, Long Prairie, Minn., assignor to Koenig & Bauer/Egenolf Machine, Inc., Indianapolis, Ind.

Filed Aug. 9, 1982, Ser. No. 406,576
Int. Cl.³ B26D *11/00*
U.S. Cl. 83—27 **14 Claims**

12. A trimming method for receiving from a book trimming apparatus the elongated glued book trimmings which have a glued end at one end in the elongated direction and for trimming the glued end, said method comprising the steps of:

a. receiving the elongated glued book trimmings from the book trimming apparatus and orientating the elongated glued book trimmings in a first orientation so that the elongated direction is in the first direction and the glued end is in a first plane perpendicular to said first direction;

b. transferring said elongated glued book trimmings in said first orientation to a cutting location while maintaining said trimmings in said first orientation;



c. cutting off said glued end with a cut in a second plane parallel to said first plane;

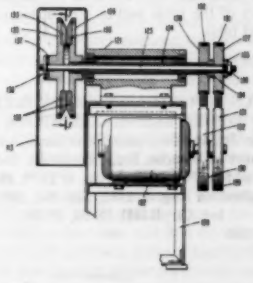
d. separating and collecting the cut glued ends separatly from the remainder of the elongated book trimmings.

4,445,408

METHOD AND APPARATUS FOR CUTTING CONTINUOUS FIBROUS MATERIAL

Garland B. Keith, 4822 Memorial Blvd., Kingsport, Tenn. 37664

Filed Sep. 24, 1979, Ser. No. 78,195
Int. Cl.³ D01G *1/04*
U.S. Cl. 83—37 **37 Claims**



25. A method of cutting funicular material into segments, comprising the steps of:

feeding said funicular material between first and second surfaces, each of said surfaces being defined by a plurality of knives with said pluralities of knives being arranged in at least partial sliding contact with one another, said knives of each of said first and second pluralities being spaced with respect to one another;

moving said first plurality of knives at a first linear speed in a first continuous path;

moving said second plurality of knives at a second linear speed, in the same direction as said first plurality of knives, in a second continuous path, said second linear speed being different than said first linear speed whereby said knives in sliding contact with one another advance with respect to one another;

cutting said funicular material between said knives in sliding contact with one another during said advancement of said knives.

4,445,409

DEVICE FOR CUTTING PAPER, CARDBOARD, AND SIMILAR MATERIALS

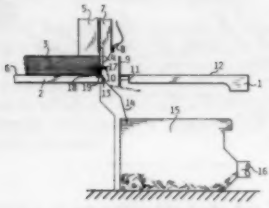
Karl Mohr, Hattersheimer Str. 11, and Wolfgang Mohr, Hundshager Weg 42, both of 6238 Hofheim, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 336,825

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101911

Int. Cl.³ B26D *5/00*

U.S. Cl. 83—157 **12 Claims**



1. Device for cutting paper, cardboard, and similar materials, comprising: a cutting table; feed means for advancing material to be cut to a desired extent along said cutting table, an intermediate cut being carried out both when the edges are trimmed and subsequent to at least one main cut; said cutting table comprising a front part for supporting trimmed material and a rear part for supporting material to be trimmed, said front and rear parts being slidable apart to leave a gap; a straightedge member being positioned under said front part of the table at a plane of separation between said two parts in a rest position when they are together, said straightedge member moving when the two parts separate from said rest position into an operating position, said straightedge lying in said operating position in contact with the total length of a rear edge of said front part of the table and at a right angle to the upper surface of said table.

4,445,410

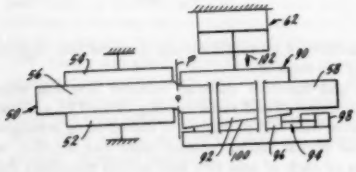
APPARATUS FOR SHEARING BARS, BILLETS, AND OTHER ELONGATED STOCK

John D. Lazar, Jr., and Benyamin Shvartsman, both of Munster, Ind., assignors to Bemcor, Inc., Hammond, Ind.

Continuation of Ser. No. 72,224, Sep. 4, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 289,363

Int. Cl.³ B23D *15/04, 35/00*

U.S. Cl. 83—390 **14 Claims**



1. In shearing apparatus for elongate stock such as bars, which includes a relatively fixed shear and a movable shear for cooperation therewith along a shearing plane; a holding clamp movable generally toward the fixed shear to hold in shearing position across it stock from which a piece is to be sheared, said clamp engaging the stock at a point spaced from the shearing plane; a backing clamp movable relatively toward the movable shear for resisting, during shearing, the bending of the portion of the stock to be severed; a carrier carrying both the movable shear and the backing clamp; clamp actuating means also carried by the carrier; and main power means for moving the carrier and its shear through the shearing stroke; the cooperative improvements in which:

said carrier is a floating carrier, free before actuation of said main power means to accommodate itself to the position of the stock as held by the holding clamp while the backing clamp is firmly set, and then to be moved in shearing action with the firmly held stock portion being severed;

said clamp-actuating means includes low-slope wedging means with power actuation to continue its firm holding throughout the shearing action, the wedging means acting between the backing clamp and carrier;

the shears are restrained from spreading apart by restraining walls held by heavy bolsters at their ends which leave an access opening along one side through which the shears can be removed for servicing, the walls adjacent the access opening being thick and sturdy to resist by their strength and end connections alone the spreading forces during shearing stock corresponding to maximum rating whereby there may be easy access through the access opening; and the clamp actuating means extending out through said opening and being readily removable with the carrier;

the shears are removable inserts, for easy replacement or servicing, in slab-like holders to which they transmit their thrust;

the spreading forces are further resisted by lower side walls forming with a bottom wall a sturdy U-shaped unitary piece.

4,445,411

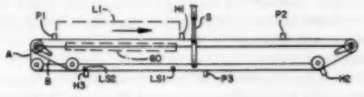
END DOGGING LOG FEEDER

Bill L. Purcell, Eureka, Mont., assignor to Hoff Companies, Inc., Boise, Id.

Filed Feb. 22, 1982, Ser. No. 350,438

Int. Cl.³ B27B *15/08, 25/04*

U.S. Cl. 83—403.1 **6 Claims**



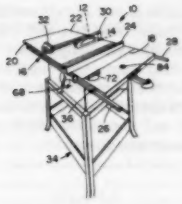
1. In a sawmill apparatus having means to move a log lengthwise in a horizontal path through a pair of vertical saws to cut slabs off opposite sides of the log, said means comprising a single horizontal track frame having an upper side extending between said saws beneath said path of the log, a pair of guideways in side by side relation in said upper side of said track frame, a first endless chain having an upper reach disposed for travel in one of said guideways, an upstanding dog on said first chain to engage one end of the log, a second endless chain disposed for travel in the other of said guideways, an upstanding dog on said second chain to engage the opposite end of the log, and means to drive said chains, the space above said track frame being free of any obstruction that would limit the diameter of logs sawed by said saws, said track frame comprising a group of vertical plates secured together in face to face relation, said plates comprising a median plate, a pair of outside plates, and a spacer plate between said median plate and each outside plate, the spaces between said median plate and said outside plates defining said pair of guideways, a pair of chain support plates in each of said guideways on opposite sides of said spacer plates, each chain having outside links riding on the top edges of said chain support plates and having median links extending downward between said chain support plates, said outside plates serving as skid plates for the log, said outside plates being interrupted between said saws to reduce the width of said track frame between the saws, said dogs being links in said chains, the log engaging faces of said dogs being inclined away from the confronting log ends at a small angle.

4,445,412

IMPROVED TABLE SAW ARRANGEMENT

Jerry M. Peters, P.O. Box 23692, San Jose, Calif. 95123

Filed Jul. 16, 1982, Ser. No. 398,974
Int. Cl.[3] B27B 5/29; B27C 9/04
U.S. Cl. 83—477.2 10 Claims



1. In a table saw arrangement (10) which includes a generally vertically oriented generally circular rotatable saw blade (12) extending upwardly through a slot (14) in a work table (16) having an edge portion (18) generally parallel to the slot (16), a pair of parallel side edge portions (20,22) generally orthogonal to the first edge portion (18), and a fence (24) selectively positionable on the table (16) in parallel relation to the slot (14) between the slot (14) and the edge portion (18), the fence (24) being slidably mounted to a pair of rails (26,28) each of which is mounted to a different one of the pair of side edge portions (20,22), an improvement comprising:

a rigid rectangular member (36) having a generally planar portion (38) having a generally centrally located member opening (40) therethrough and first first (44), second (46), third (48) and fourth (50) peripheral portions (44,46,48,50), said first (44) and third (48) peripheral portions (44,48) being generally parallel to one another and said second (46) and fourth (50) peripheral portions (46,50) being generally parallel to one another, said peripheral portions (44,46,48,50) extending generally orthogonally downwardly from said planar portion (38), each of said peripheral portions (44,46,48,50) having edges (52,54,56,58,60,62,64,66), respective adjacent of which are fixed together;

means (68) for fastening said first peripheral portion (44) in adjacent fixed relation to said edge portion (18) of said work table (16);

a rigid generally planar adaptor plate (76) of smaller dimensions than said rectangular member (36), said adaptor plate (76) having a generally centrally located plate opening (78);

means (82) for mounting said adaptor plate (76) to any of a variety of power tools having an extending working member (84), said plate opening (78) being adapted to unobstructingly pass said extending working member (84) when said one of said tools is mounted to said adaptor plate (76); and

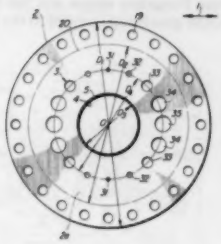
a plurality of fastener-spacers (92) attached between said planar portion (38) of said rectangular member (36) and said adaptor plate (76) and being adapted to fasten said adaptor plate (76) in rigid generally parallel relation to said planar portion (38) of said rectangular member (36) a spaced distance below said planar portion (38) with said member opening (40) generally coaxially aligned with said plate opening (78), said plate opening (78) being adapted to unobstructingly pass said extending work member (84).

4,445,413

SLICING CUTTER BLADE

Kunio Ohwada, Tokyo, Japan, assignor to Kabushiki Kaisha Fujikoshi t/a Nachi-Rujikoshi Corp., Toyama, Japan

Filed Jan. 8, 1982, Ser. No. 338,130
Claims priority, application Japan, Mar. 23, 1981, 56-40477
Int. Cl.[3] B23D 31/00; B26D 7/26; B28D 1/32
U.S. Cl. 83—676 3 Claims



1. A slicing cutter blade, adapted for securing to a holder means having a tension ring provided with a protuberance thereon, comprising an annular sheet steel body having a central opening therein, said annular body being rolled in a predetermined direction and including:

a cutting edge formed at the inner circumferential edge of the central opening in said annular body;

an outer circumferential portion secured to said holder means;

a tension generating section adjacent said outer circumferential portion, said tension generating section being forced into contact with the protuberance on the tension ring of said holder means; and

a middle portion located between said cutting edge and said tension generating section, said middle portion having a plurality of circumferentially arranged and equidistantly spaced circular apertures disposed thereon for generating increased circumferential stress in said cutting edge, a first group of circular apertures being located on a first line parallel to said predetermined direction which passes through the center of the central opening in said annular body, said first group of circular apertures having a first diameter; a second group of circular apertures being located on a second line perpendicular to said first line which passes through the center of said central opening, said second group of circular apertures having a second diameter which is less than said first diameter; and a third group of circular apertures located intermediate said first and second lines having diameters greater than the diameter of the apertures on said second line, the diameters of said intermediately located apertures increasing as their distance from said second line increases.

4,445,414

DIGITAL, SIMULTANEOUS, DISCRETE FREQUENCY GENERATOR

Burrell Smith, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 24, 1982, Ser. No. 351,653
Int. Cl.[3] G10H 7/00
U.S. Cl. 84—1.01 5 Claims

1. An apparatus for generating simultaneous multiple frequencies comprising:

base frequency means for generating a plurality of base frequencies;

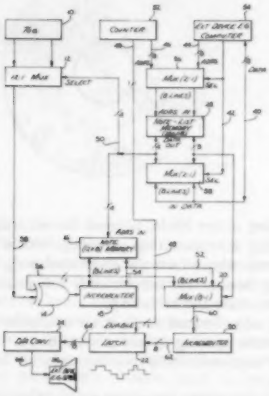
note memory for storing as many corresponding words as the number of said plurality of base frequencies;

comparison means for comparing the lowest order bit of each said word in said note memory to said corresponding

base frequencies, said comparing occurring at a higher rate than the highest base frequency; and

increment means for adding 1 to said corresponding word in said note memory if comparison by said comparison means indicates inequality between said base frequency and said lowest order bit;

wherein said comparison means includes an exclusive OR gate and said incrementing means includes an incrementer, one input of said exclusive OR gate being coupled to said base frequency means and the other input of said exclusive OR gate being coupled to the least significant bit



output line from said note memory, the output of said exclusive OR gate being coupled to one input of said incrementer, the other inputs of said incrementer being coupled to the outputs of said note memory,

whereby the output of said exclusive OR gate is added to the addressed contents of said note memory to create a word representative of the pitch of the base frequency where each higher order bit is a lower octave of said base frequency, and

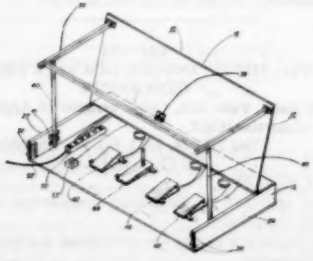
octaves of each said base frequencies are generated for simultaneous output.

4,445,415

PORTABLE CASE AND STAND FOR PEDAL CONTROLS OPERATIONALLY FIXED THEREIN FOR USE WITH A KEYBOARD TEMPORARILY MOUNTABLE THEREON

George J. Izquierdo, 409 Elise Ave., Metairie, La. 70003

Filed Aug. 18, 1982, Ser. No. 409,195
Int. Cl.[3] A45C *11/00*; G10G *5/00*
U.S. Cl. 84—177 4 Claims



1. A portable case and stand for effects control pedals used by a keyboard temporarily mountable thereon, comprising:

(a) a narrow elongated box defines a carrying and storage compartment when closed for said pedals and miscellaneous gear, and defines a keyboard stand when opened with said pedals operationally fixed and interconnected, said box having a removable narrow elongated side and a hinged part of a wide side cooperating for said opening and closing;

(b) a frame, pivoted adjacent an oppositely disposed edge from the hinged edge of said hinged part to said wide side, is adapted to pivot upwardly and outwardly orthogonal to said hinged part that is swung outwardly orthogonal to said box; and

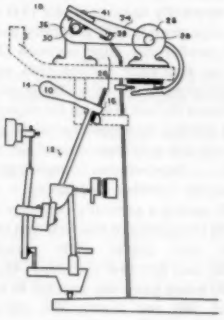
(c) two legs, storable in said storage compartment, is adapted to vertically engage said box and frame to support said frame horizontally, with hinged part and said frame orthogonal to their respective supporting box structure, whereby a keyboard placed on said horizontally supported frame is operationally positioned above said operationally fixed and connected effects control pedals for immediate connection therewith.

4,445,416

PLAYER PIANO DEVICES

Walter Quednau, 755 Ilex Ct., Lake Park, Fla. 33403

Filed Oct. 9, 1980, Ser. No. 195,327
Int. Cl.[3] G10C *3/20*
U.S. Cl. 84—244 5 Claims



1. An apparatus for causing a piano hammer head to repeatedly strike its associated piano wire, attendant depression of its associated key, for the duration of such key depression, comprising,

a motor means having an output shaft,

an elongate rotatably mounted shaft connected in drive relation to said output shaft,

a first mounting block means fixedly secured to and conjointly rotatable with said rotatable shaft,

a plurality of flexible paddle means corresponding in number to the number of said piano wires and adjustably secured, in lateral relation to one another, to said rotatable first mounting block means,

a hammer head extension means attached to each of said hammer heads,

each of said hammer head extension means specifically disposed in path-interruptive relation to an associated one of said flexible paddle means attendant rotation thereof so that each rotation of said first mounting block means causes said flexible paddle means to impinge upon and momentarily displace said hammer head extension means and hence said hammer head into transient piano wire-impinging relationship,

means for disabling said paddle means from impinging upon said hammer head extension means when it is desired to play said piano in a conventional mode of operation, said disabling means also serving to de-activate said motor means so that said paddle means impinges upon said ham-

mer head extension means only when said motor means is activated,

said disabling means at least in part comprising a second mounting block means fixedly secured to and hence conjointly rotatable with said elongate rotatable shaft,

said second mounting block means axially spaced a predetermined distance from said first mounting block means,

a spring stop lever means fixedly secured to said second mounting block means and specifically disposed to project outwardly therefrom in substantially co-planar relationship therewith,

a first, movably mounted, two position, link member,

means for moving said first link member from a first position to a second position,

said first position of said first link member disposing one end of said link member in path-interruptive relation to said rotatable spring stop lever means,

said spring stop lever means-carrying second mounting block means specifically oriented so that when rotation of said second mounting block means is terminated by said end of said first link member, disposed in path-interruptive relation thereto when said first link member is in said first position, the conjoint rotation of said paddle means is also terminated and said paddle members are collectively disposed in non-interfering relation to said hammer head extension means, thereby allowing said piano to be played in a conventional fashion.

4,445,417

METHOD AND MACHINE FOR MAKING SQUARE-MESHED NET

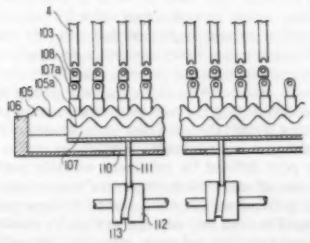
Toshikazu Iijima, 20, Shimogou, Isshiki-cho, Gamagouri-Shi, Aichi-ken, Japan, and Shuichi Ito, Yotsukaichi, Japan, assignors to Toshikazu Iijima, Aichi, Japan

Filed Jan. 9, 1981, Ser. No. 223,784

Claims priority, application Japan, Apr. 23, 1980, 55-52987

Int. Cl.³ D04G *1/08*

U.S. Cl. 87—12 **8 Claims**



1. Method for knotting a square-meshed net, comprising the steps of arranging warp strands and weft strands on the inside and outside of upper hooks arranged in circular form, each particular warp (or weft strand being opposite a particular upper hook and a particular weft (or warp) strand, knotting each particular warp (or weft) strand to the particular weft (on warp) strand by the particular upper hook, and transferring the particular weft (or warp) strand in one cycle of the knotting to a next adjacent upper hook in a prescribed direction and knotting it to the next adjacent warp (or weft) strand, by said next upper hook.

4,445,418

DRUM MAGAZINE FOR A GUN

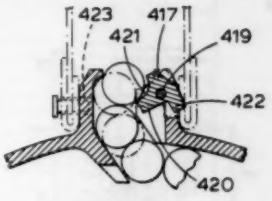
Leroy J. Sullivan, and Robert L. Waterfield, both of Singapore, Singapore, assignors to Chartered Industries Of Singapore Private Limited, Jurong Town, Singapore

Division of Ser. No. 280,177, Jul. 6, 1981, Pat. No. 4,384,508. This application Sep. 14, 1982, Ser. No. 417,946

Claims priority, application United Kingdom, Dec. 11, 1980, 8039745

Int. Cl.³ F41C *25/10*

U.S. Cl. 89—33 D **9 Claims**



1. A drum magazine for a gun including a housing having a peripheral wall defining a circularly cross-section interior, a feed throat extending through the said wall for releasing cartridges from the housing to provide an opening in said peripheral wall, said opening having a first side and a second side with an outer extremity of said first side of said opening being provided with a fixed lip extending over the feed throat and said second side of said opening being provided with a spring biassed movable lip biassed in a direction outwardly of the magazine, the spacing between the lips being dimensioned so that a cartridge leaving the feed throat can only be slid therefrom in the direction of the housing axis and in no other direction when the magazine is mounted on a gun.

4,445,419

AMMUNITION CONTAINER, ESPECIALLY DRUM MAGAZINE

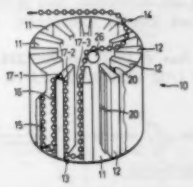
Pierre Fischer, Geneva, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 20, 1982, Ser. No. 419,763

Claims priority, application Switzerland, Oct. 14, 1981, 6560/81

Int. Cl.³ F41D *10/26*

U.S. Cl. 89—33 D **5 Claims**



1. An ammunition container arrangement, especially a drum magazine, comprising:

means defining a drum magazine;

side walls for dividing said drum magazine into a plurality of compartments for receiving loops of an ammunition belt;

each loop of the ammunition belt comprising two adjacently arranged loop portions;

each loop portion bearing against one of the side walls of its related compartment;

a respective magnet arranged between each loop portion of the cartridge belt and the related side wall of the compartment; and

each such magnet being secured to its related side wall and

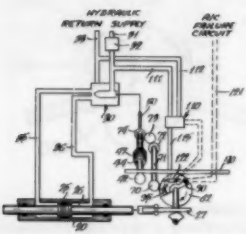
attracting the loop portion of the ammunition belt in order to secure the same against displacement towards the center of the drum magazine.

4,445,420

POWER BOOST MECHANISM

David J. Lang, and John Readman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 36,133, May 4, 1979, Pat. No. 4,304,171.
This application May 11, 1981, Ser. No. 262,124
Int. Cl.³ F15B *9/12, 13/16*
U.S. Cl. 91—3 **19 Claims**



1. A power boost mechanism for converting pilot linear throttle input commands to rotary motion of an output shaft, said mechanism comprising:

an input member movable in response to a throttle input command;

power boost means responsive to movement of the input member for causing rotation of the output shaft;

feedback means associated with the output shaft and responsive to movement thereof for returning said power boost means to a null position independently of said input member;

means automatically enabling direct operation of the output shaft by said input member when said power boost means is inoperative; and

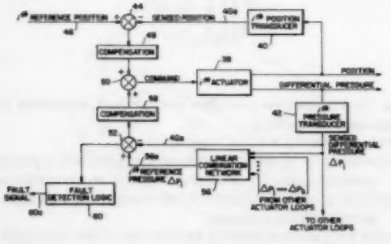
shift means responsive to a malfunction signal for imparting limited rotation to said output shaft without movement of said input member.

4,445,421

HELICOPTER SWASHPLATE CONTROLLER

Bruce K. Walker, Shaker Heights, Ohio; Mukund Desai, Needham, and Eliezer Gai, Somerville, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 6, 1981, Ser. No. 318,690
Int. Cl.³ F01B *3/02;* **F15B** *11/10, 13/16;* **B64C** *11/38*
U.S. Cl. 91—186 **5 Claims**



1. A control system for a helicopter swashplate, comprising:

A. five or more non-colinear hydraulic actuators coupled to said swashplate, each of said actuators including a ram responsive to a command signal for that ram and further including associated first transducer means for generating a ram position signal representative of the position of said ram, and second transducer means for generating a ram differential pressure signal representative of the differential pressure across said ram, and command signal generator means for generating said command signal,

B. a controller means including means responsive to the ram differential pressure signals from all of said actuators for generating a reference differential pressure signal for each of said actuators, wherein said reference differential pressure signals are linear combinations of said ram differential pressure signals,

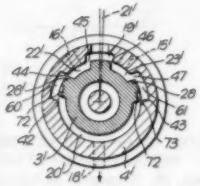
wherein said command signal generator means includes means for generating said command signal for each ram whereby said command signal is representative of the sum of (1) the difference between the ram position signal for that ram and a signal representative of a reference position for that ram and (2) the difference between the ram differential pressure signal for that ram and said reference differential pressure signal for that ram.

4,445,422

POWER STEERING VALVE

Arthur E. Bishop, 17 Burton St., Mosman, N.S.W., Australia

Continuation of Ser. No. 115,412, Jan. 25, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,643
Claims priority, application Australia, Jan. 26, 1979, PD7480
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—434 **5 Claims**



1. A hydraulic control valve for a vehicle power steering system comprising an inlet port and a return port for hydraulic fluid flow supplied by a pump, a hydraulic motor means for effecting a right or left turn force as a function of a pressure differential between right and left sides in said motor means, corresponding outlets formed in said valve for respective fluid flow connection to said right and left sides of said motor means, said motor means being connected to supplement turning forces transmitted from a steering wheel to vehicle wheel steering means, said valve having at least one pair of symmetrical passages connecting the inlet port to the return port, each passage having spaced therein a first variable area orifice adjacent said inlet port and a second variable area orifice adjacent said return port defined by relatively movable parts of the valve with one of said outlets respectively interposed in each said passage between said first and second orifices, said orifices being arranged in each said passage so that, by reason of relative movement between said parts, when the first orifice in the one passage is in the course of opening the second orifice is in the course of closing and when the first orifice in the one passage is in the course of closing the second orifice is in the course of opening according to the magnitude of turning forces applied to produce relative movement of said parts so that hydraulic fluid is directed towards the interposed outlet of the respective passage or away therefrom respectively to cause said motor means to produce a force supplementing said turning forces, the improvement comprising in that, in each of said at least one pair of passages, an additional orifice is added between the outlet in that passage and return port, which additional orifice is closing when the second orifice lying between the outlet in that passage and the return port is open-

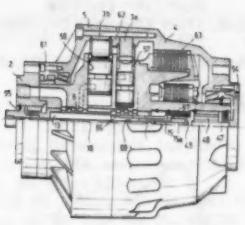
ing such that, when the turning forces transmitted from said steering wheel are small, the additional orifice restricts the flow of hydraulic fluid from the outlet to the return port providing a back pressure at the outlet in that passage whereby the turn force effected by said motor means is less than would have been the case in the absence of such additional orifice.

4,445,423

HYDRAULIC MOTOR

Ilmari Louhio, Helsinki, Finland, assignor to Oy Partek AB, Finland

Filed Mar. 31, 1981, Ser. No. 249,710
Claims priority, application Finland, Apr. 14, 1980, 801183
Int. Cl.³ F01B *13/06, 25/00*
U.S. Cl. 91—492 **9 Claims**



1. A hydraulic motor provided with two cylinder sets arranged around a shaft and having diameters of different sizes with a sliding spindle valve structure, having fluid pressure reactive surfaces thereon, controlled by the pressure medium being arranged in a bore formed in the motor shaft for directing the pressure medium alternatively to both cylinder sets, to the larger-diameter cylinder set only or to the smaller-diameter cylinder set only, characterized in that the valve spindle structure comprises means for connecting the pressure openings of the cylinder set remaining without pressure medium to a space in which return pressure prevails, and means for connecting the pressure openings in both cylinder sets to the return pressure when the working pressure of the motor approaches the return pressure, said connecting means including said sliding spindle valve which slides in response to a pressure differential thereacross, on fluid pressure reactive surfaces of the spindle valve, between the working pressure and the return pressure.

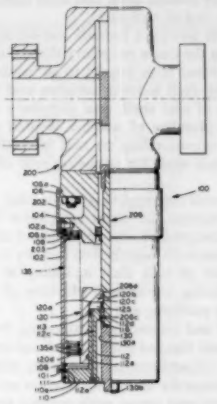
4,445,424

ACTUATOR HAVING BELLEVILLE WASHER CONFIGURATION OPERATING IN CONCERT WITH A PISTON CYLINDER MEMBER

Stephen R. Foster, Gretna, and Peter W. Austin, New Orleans, both of La., assignors to Baker Cac, Inc., Belle Chase, La.

Filed Oct. 2, 1981, Ser. No. 307,713
Int. Cl.³ F01B *31/12*
U.S. Cl. 92—5 R **1 Claim**

1. A fluid pressure actuator for a valve having a housing and an actuating stem comprising: an annular housing having one end attachable to the valve housing; a cylindrical piston element concentrically fixedly mounted in the other end of said annular housing and extending into the interior of said annular housing toward said one end; a cupshaped cylinder slidably and sealably mounted on the exterior of said cylindrical piston and defining an annular space between its exterior surface and an interior wall surface of said annular housing; a radially outwardly projecting flange on the open end of said cupshaped cylinder; conduit means for supplying pressured fluid to the interior of said cylinder to urge same toward the valve housing; resilient means mounted in said annular space and engaging said flange to oppose the fluid pressure produced movement of said cylinder; means for connecting said cylinder to the actuating stem of the valve; said cylindrical piston element having a central bore, an indicating stem slidably and sealingly co-operating with said central bore, and means for connecting the inner end of said indicating stem for co-movement with said cup-shaped cylinder, the length of said indicating stem being only slightly greater than the depth of said piston bore.

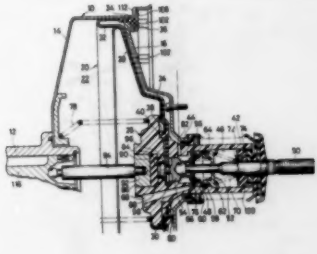


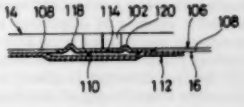
4,445,425

HOUSING SHELLS OF FLUID PRESSURE MOTORS

Atsushi Ohmi, Anjo, and Chiaki Ochiai, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 15, 1981, Ser. No. 283,547
Claims priority, application Japan, Jul. 29, 1980, 55-107790[U]
Int. Cl.³ F01B *19/02;* **F16J** *3/02*
U.S. Cl. 92—98 D **5 Claims**





1. A fluid pressure servomotor comprising:
a stamped open ended sheet metal shell forming an axially extending internal chamber of uniform cross section adjacent said open end;
a radially outwardly bent shoulder around the external periphery of said shell and spaced a distance from said open end thereof, said shell having a plurality of slots formed therein at generally regular intervals around the periphery

of said shell a predetermined distance axially outwardly of said shoulder;

a plurality of radially inwardly extending portions projecting radially inward from said shell between said slots and said open end of said shell;

an end cover having a radially outwardly opened channel formed on the outer periphery thereof and a flanged edge slidingly fitted with respect to an inside portion of a section of the shell located between said shoulder and said open end of said shell, said periphery of said end cover having a plurality of notches formed therein at regular intervals corresponding to said inwardly extending portions of said shell for receiving said inwardly extending portions;

a movable wall disposed in said chamber and having a diaphragm portion, an outer peripheral bead of said diaphragm compressed into said channel on said end cover in cooperation with said shell to thereby provide a fluid seal;

said shoulder of said shell including at least one dented portion facing one of said plurality of radially inwardly extending portions; and

at least first and second tabs extending from the peripheral edge of said flanged edge of said end cover and facing in opposite circumferential directions with respect to said radially inwardly extending portion such that upon rotation of said end cover with respect to said shell during assembling, disassembling or reassembling said peripheral edge of said flanged edge cooperates with at least one of said plurality of radially inwardly extending portions to resiliently deform into said at least one dented portion so that said at least one tab will slidably pass at least one of said plurality of radially inwardly extending portions.

4,445,426

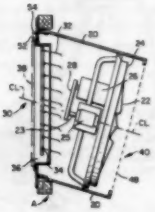
SLANTED HOUSING FAN ENCLOSURE

Hoy R. Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corporation, Muskogee, Okla.

Continuation of Ser. No. 273,247, Jun. 12, 1981, abandoned. This application Feb. 1, 1983, Ser. No. 463,010

Int. Cl.³ F24F *13/06*

U.S. Cl. 98—116 **7 Claims**



1. A housing and fan for mounting at an opening in in a wall of a building, comprising

a housing lying along an axis and having an inlet opening and an outlet opening at respective ends thereof, said inlet opening of said housing being located in the vicinity of the opening within the wall of the building when said housing and fan are mounted in place; a first flange extending upwardly from the top of said housing at said inlet opening, said first flange lying along a plane which forms with said axis of said housing an angle greater than ninety degrees assisting in operatively connecting the top of said housing and the top of the opening in the wall; a second flange extending downwardly from the bottom of said housing at said inlet opening, said second flange lying along a plane which forms with said axis of said housing an angle less than ninety degrees assisting in operatively connecting the bottom of said housing and the bottom of the opening in the wall; said outlet opening of said housing being outside of the building and located a distance from the wall of the building when said housing and fan are mounted in place; and wherein the axis of said housing slants downwardly away from the building such that said outlet opening of said housing extends below said inlet opening of said housing;

a fan assembly mounted within said housing and having its axis generally aligned with said axis of said housing; and

a plurality of shutter elements positioned at said inlet opening of said housing and mounted to move between open and closed positions, the angles said shutter elements assume when in open position being generally aligned with the angles of said axis of said housing and said axis of said fan assembly.

4,445,427

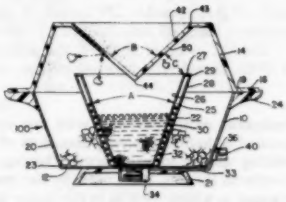
POPCORN POPPER

Casimir R. Kiczek, 27109 Kingswood Dr., Dearborn Heights, Mich. 48127

Filed Dec. 15, 1980, Ser. No. 216,158

Int. Cl.³ H23L *1/18*

U.S. Cl. 99—323.5 **9 Claims**



1. A device for heating oil and kernels of unpopped corn on a surface to make popcorn, said device comprising:

receptacle means, disposed on said surface, for receiving corn which has been popped;

a popping vessel mounted to said receptacle means, said popping vessel receiving the oil and the kernels of unpopped corn therein;

means, attached to said popping vessel, for heating the oil and the kernels of unpopped corn such that the kernels of unpopped corn are heated to the popping temperature to pop the kernels of unpopped corn to form popcorn; and

means, disposed above said heating means, for deflecting the corn which has been popped upward as a result of forming popcorn out of said popping vessel into said receptacle means so as to separate the corn which has been popped from the kernels of unpopped corn in said popping vessel, said deflecting means further having a deflector member disposed toward said popping vessel.

4,445,428

COOKING GRILL HEATED FROM DEEP FAT FRYER

J. Philip Buford, 513 N. Boston Ave., De Land, Fla. 32720

Continuation-in-part of Ser. No. 249,937, Apr. 1, 1981, abandoned. This application Nov. 3, 1982, Ser. No. 439,024

Int. Cl.³ A47J *37/00*

U.S. Cl. 99—340 **12 Claims**

1. A cooking grill for use with deep fat frying containers holding a cooking oil comprising:

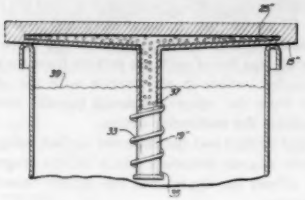
a generally flat grill plate; and

mounting means to support said grill plate adjacent the top of a deep fat frying container;

a heat pipe containing a liquid medium and extending from said grill plate into the cooking oil in the deep fat frying container to convey heat from the cooking oil to said grill plate; and

a flash boiler tube associated with said heat pipe, a first end

of said tube being in fluid communication with the interior of said heat pipe at the bottom thereof, and a second end



of said tube being in fluid communication with the interior of said heat pipe above said first end.

4,445,429

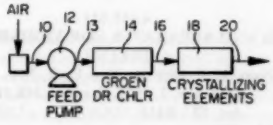
APPARATUS FOR CHILLING AND PLASTICIZING FATTY MATERIALS

Ted S. Czyzewski, Bloomingdale, and Bartley A. Greenwell, Crystal Lake, both of Ill., assignors to Groen Division - Dover Corporation, Elk Grove Village, Ill.

Division of Ser. No. 356,958, Mar. 11, 1982. This application Apr. 26, 1983, Ser. No. 488,700

Int. Cl.³ A23D *3/02, 5/02*

U.S. Cl. 99—455 **3 Claims**



1. Apparatus for chilling and plasticizing fatty materials which have 5–25% air or inert gas by volume added thereto so as to be white and opaque rather than translucent comprising a means for cooling and partially crystallizing said fatty material from approximately 130°–140° F. to within a range of 70°–86° F.; at least one crystallizing element which comprises a motionless mixer for applying a shearing action to said cooled and partially crystallized material to provide a material having a fine crystal structure by the rotational circulation of said material around its own hydraulic center to cause radial mixing of said material; means for conveying said cooled and partially crystallized material to said crystallizing element and means for conveying the output of said crystallizing element to a filler.

4,445,430

METHOD AND APPARATUS FOR SORTING, COUNTING AND FLATTENING CANS

Melvin L. Pyne, P.O. Box 997, Brookings, Oreg. 97415, and Robert B. Allsup, Box 2053, Harbor, Oreg. 97415

Filed Oct. 27, 1981, Ser. No. 315,554

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—35 **25 Claims**

1. A method of sorting, counting, and flattening a plurality of various brand name cans, each can having identifying indicia provided on a ring end thereof, comprising:

(a) providing a plurality of branded can tubes to receive the different can brand names;

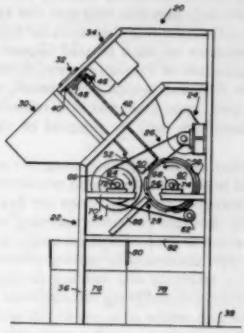
(b) feeding the branded cans to correspondingly branded can tubes;

(c) counting each can as it passes through a branded can tube;

(d) providing a pair of juxtaposed flattening rollers at an outlet end of each of the branded can tubes, and providing one of the rollers with a surface configured to produce a gripping effect on the ring end of a can;

(e) rotating the rollers in opposite directions relative to each other;

(f) flattening the cans between the rotating rollers in a manner whereby the body of the can is folded over the back side of the ring end of the can so that all identifying indicia on the ring end are easily readable; and,



(g) collecting by brand name the sorted, counted and flattened cans in individual containers located downstream from the rotating rollers.

4,445,431

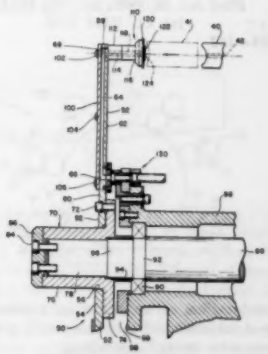
DISK TRANSFER SYSTEM

James S. Stirbis, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Feb. 7, 1983, Ser. No. 464,555

Int. Cl.³ B65G *47/04;* **B41F** *17/20*

U.S. Cl. 101—40 **8 Claims**



1. Apparatus for continuously conveying decorated container members having wet ink images on the outer periphery thereof between a first continuously moving rotatable mandrel wheel type container carrying apparatus of a high speed container decorator or coater machine and a high speed second continuously linearly moving pin chain container carrying apparatus comprising:

a continuously rotatable disk type conveyor means rotatably movable in a predetermined endless path between the first and second continuously moving container carrying apparatus including a first path portion located in juxtaposition to the first continuously moving container carrying apparatus for receiving decorated container members there-

from and a second path portion located in juxtaposition to the second continuously moving container carrying apparatus delivering decorated container members thereto;

a plurality of individual circumferentially spaced vacuum cup means fixedly peripherally mounted in equally spaced relationship on and extending laterally outwardly of and being continuously movable with said disk type conveyor means in fixed relationship therewith for holding a single container member on each of said vacuum cup means, only by application of vacuum thereto during movement between the first and second continuously moving container carrying apparatus and for releasing container members therefrom only by removal of vacuum therefrom;

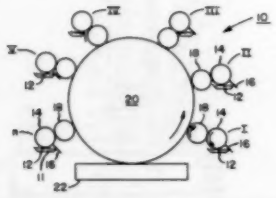
vacuum chamber means extending along the path of movement of and in substantially sealed relationship with said disk type conveyor means between the first and second continuously movable container carrying apparatus and being connected to each of said vacuum cup means adjacent to the first continuously moving container carrying apparatus for receiving and holding container members delivered therefrom and being disconnected from each of said vacuum cup means adjacent to the second continuously moving container carrying apparatus for releasing the container members for supportive engagement therewith and being continuously connected to each of said vacuum cup means during movement between the first continuously moving container carrying apparatus and the second continuously moving container carrying apparatus for holding the container members thereon solely by applied vacuum during non-supportive association with the second continuously moving container carrying apparatus.

4,445,432

ARTICLE DECORATING

Clarence E. Ford, Jr., Painted Post, N.Y., and Ronald E. Johnson, Tioga, Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,129
Int. Cl.³ B41F *9/02*
U.S. Cl. 101—152 **16 Claims**



1. In combination, an apparatus for printing multicolored designs on a substrate and a thermoplastic pressure sensitive ink for each color thereof comprising:

a supply of each thermoplastic ink, the supply being heated to a temperature sufficient to melt the ink, said inks containing no volatile solvents which evaporate during the movement of the inks from the ink supply to the substrate, the composition of said inks remaining substantially unchanged during the printing operation;

an inking surface for each supply of ink, the inking surface being heated to a temperature above the melting point of the ink and engaging the supply for receiving thereon a selected amount of the ink in melted form;

an elastomeric transfer surface associated with each inking surface, the transfer surface operating at a temperature below that of the associated inking surface and contacting the associated inking surface for receiving thereon selected amounts of the ink from the inking surface in the form of a pattern, the ink becoming cooled to below its melt point upon contact with the transfer surface; and

an elastomeric collector surface operating at a temperature not greater than the temperature of the transfer surface, the transfer surfaces being positioned around the collector surface for contacting the same at spaced locations with synchronous movement to provide on the collector surface a total transfer of each ink pattern from each associated transfer surface in registration with the other ink patterns from the other associated transfer surface, to thereby form the multicolor design;

each transfer surface and the collector surface being formulated from silicone materials which exhibit progressively greater affinity for the ink but less affinity therefor than the substrate;

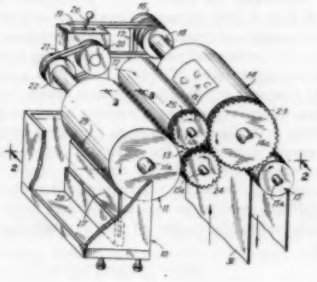
the ink being formulated to melt upon the application of heat and to form a cohesive film and become pressure sensitive upon cooling to below the melt point thereof, said cohesive film serving to hold said ink together to provide total transfer of said ink from the transfer surface to the collector and thence to the substrate without leaving behind any material.

4,445,433

METHOD AND APPARATUS FOR VARIABLE DENSITY INKING

Menashe Navi, 12 E. 18th St., New York, N.Y. 10003

Filed Apr. 2, 1982, Ser. No. 365,013
Int. Cl.³ B41F *31/06*; B41L *27/08*
U.S. Cl. 101—350 **8 Claims**



1. A variable density inking apparatus for a printing apparatus employing a celled ink metering roll such as a letter press or lithographic press comprising ink fountain means, an anilox roll mounted in ink receiving position relative to said fountain means, said anilox roll including a multiplicity of outwardly open cells on the periphery thereof, metering means wipingly engaging the surface of said anilox roll for removing therefrom ink film externally of said cells, a printing roll rotatable relative to said anilox roll, at least one resilient form roll interposed between said printing roll and said anilox roll, said form roll being in peripheral contact with said printing roll and being pressed against said anilox roll to indent into said cells of said anilox roll, said anilox, form, and printing rolls being rotatable about parallel axes, the contacting portions of said rolls rotating in the same direction, the combination including means for varying the relative peripheral speed of said form and anilox rolls in the range of from about 1:3 to 3:1.

4,445,434
ARRANGEMENT FOR THE CONTACTLESS TRANSMISSION OF ELECTRIC ENERGY TO MISSILES DURING FIRING THEREOF

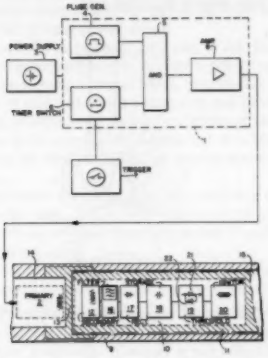
Uwe Brede, Fürth, and Gerhard Kordel, Nuremberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,863

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024554

Int. Cl.³ F42C *19/12*

U.S. Cl. 102—206 **20 Claims**



1. An arrangement for the contactless transmission of electrical energy to a missile during the firing thereof from a firing device, the arrangement comprising a transformer-like coil system including a primary coil system connected to the firing device and a secondary coil system connected to the missile, the primary coil system being supplied with electric energy and the secondary coil system being responsive to the electric energy developed in the primary coil system for developing electrical energy therein, partition means arranged between the primary coil system and the secondary coil system, the partition means comprising a non-magnetic material and being capable of withstanding thermal and mechanical stresses of repeated firings by the firing device, the partition means being fixedly connected with the firing device and disposed for sealing the primary coil system with respect to the missile at least during the firing of the missile from the firing device, and a housing having two opposed recesses and an intermediate bottom member for at least substantially separating the two recesses, a pin-shaped core extending from the intermediate bottom member so as to delimit an annular shape for one of the two recesses and the housing, the one of the two recesses and the housing forming a resonant cavity half shell for accommodating the secondary coil system therein, the other of the two recesses and the housing being arranged for accommodating electrical components connected to the output of the secondary coil system.

4,445,435
ELECTRONIC DELAY BLASTING CIRCUIT

Gerald L. Oswald, New Ringgold, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Continuation-in-part of Ser. No. 146,192, May 5, 1980, Pat. No. 4,328,751. This application Mar. 12, 1982, Ser. No. 357,483

Int. Cl.³ F42C *11/06*

U.S. Cl. 102—215 **2 Claims**

1. A circuit for firing an ignition element following a time delay, comprising:

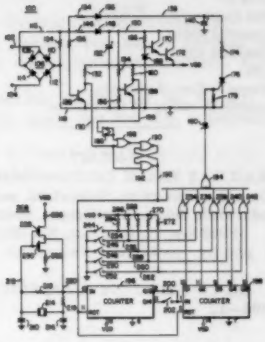
means for storing an electrical charge,

means for receiving an input signal to provide electrical energy therefrom to said means for storing,

means for storing a digital reference count to determine the duration of said time delay,

means responsive to an amplitude transition of said input signal for generating an initiating signal,

digital timing means connected to receive said digital reference count and said initiating signal for generating an ignition signal at the expiration of the period of said time delay following receipt of said initiating signal, and



means responsive to said ignition signal for connecting said means for storing an electrical charge to said ignition element for firing said ignition element.

4,445,436
PROJECTILE FOR CENTRIFUGAL LAUNCHING DEVICE

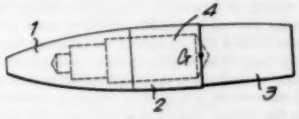
Léon L. Rutten, 29, rue Duvivier, 4000 Liege, Belgium

Filed Nov. 30, 1981, Ser. No. 326,009

Claims priority, application Belgium, Dec. 4, 1980, PV2/58886

Int. Cl.³ F42B *11/02*

U.S. Cl. 102—501 **2 Claims**



1. A projectile for a centrifugal gun having a gun vane for launching the projectile, comprising: (a) an ogival head portion; (b) a generally cylindrical body portion joined to the ogival head portion in a first transverse plane, the diameter of the cylindrical body portion being equal to the longest diameter of the ogival head portion; and (c) a tail portion joined to the cylindrical body portion in a second transverse plane, the center of gravity of the projectile being within 1.5 mm of the second transverse plane, the outer surface of the tail portion being curved, the curve being defined by a system of Cartesian axes located in an axial plane of the projectile wherein the x-axis coincides with the longitudinal axis of the projectile and the y-axis extends from the junction of the cylindrical body portion and the tail portion such that:

$$x = A(\alpha + \tfrac{1}{4}\sin 2\alpha) + B + C\sin\alpha - D\cos^2\alpha$$

$$y = D(\tfrac{1}{4}\sin 2\alpha - \alpha) + C\cos\alpha - A\sin^2\alpha$$

where:

α = angle (in radians) the gun turbine must cover to completely eject projectile

$$\left.\begin{aligned} A &= K \sin \mu \\ D &= K \cos \mu \end{aligned}\right\} K = \frac{30}{\pi} \frac{V_R}{N}$$

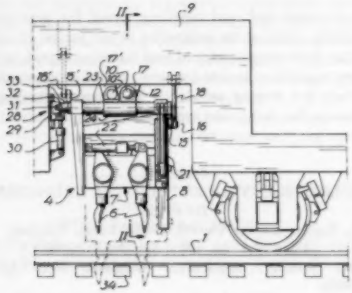
μ = arctan $\frac{v}{V}$
v = radial ejection speed m/s
V = tangential speed
V_R = resulting speed
N in rpm
B = extreme radius of gun = r_2
C = $\frac{1}{4}$ calibre or radius of the calibre.

4,445,437

RAILWAY TRACK TAMPING MACHINE

Arne Nielsen, La Conversion, Switzerland, assignor to Sig Societe Industrielle Suisse, Schaffhausen, Switzerland

Filed Sep. 15, 1980, Ser. No. 186,908
Claims priority, application Switzerland, Oct. 5, 1979, 8998/79
Int. Cl.[3] **E01B** *27/16, 31/00;* **E02F** *5/22*
U.S. Cl. 104—12 **6 Claims**



1. In a railway track tamping machine comprising a rolling chassis for rolling on a railway track, said rolling chassis being equipped with two independent tamping units arranged on opposite sides of each line of rails of said railway track, each of said tamping units comprising at least two pivoted tamping tools mounted in opposition on a tool holder which is mounted for vertical movement in a gantry which is, in turn, mounted movably on the rolling chassis in a vertical plane transverse to the railway track, the improvement of each gantry being mounted on the rolling chassis via a connecting device comprising means for effecting translation movement of the gantry transverse to the track, means for effecting pivotal movement of the gantry transverse to the track, coordinating means to combine said translation movement and said pivotal movement of the gantry transverse to the track, and motor means for driving one of said means for effecting translation movement, said means for effecting pivotal movement, and said coordinating means.

4,445,438

BALLAST TAMPING TOOL UNIT

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Feb. 5, 1982, Ser. No. 346,226
Claims priority, application Austria, Mar. 9, 1981, 1084/81
Int. Cl.[3] **E01B** *27/16*
U.S. Cl. 104—12 **5 Claims**

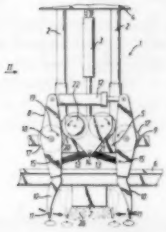
1. A tamping tool unit for a ballast tamping machine which comprises a frame and a tamping tool unit carrier vertically adjustably mounted on the frame, the unit comprising

(a) a pair of tamping tool holders, each holder having affixed thereto a tamping tool for immersion in the ballast adjacent a point of intersection of a track tie and rail where the track is supported on the ballast,

(b) an axle pivotally supporting each tamping tool holder on the carrier, the axle extending transversely to the track,

(c) a hydraulic reciprocating drive means for pivoting the tamping tool holders independently of each other and asynchronously towards and away from each other transversely of the track tie,

(d) eccentric means supporting each axle and imparting thereto a constant horizontal and vertical motion with respect to the carrier upon rotation of the eccentric means about an axis spaced from the axle,



(e) transmission means connecting the eccentric axle supporting means and arranged to cause the motions of the axles to be effected in opposite directions, and

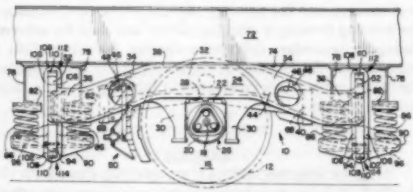
(f) a common vibrating drive connected to one of the eccentric axle supporting means for rotating the same about said axis to impart to the axles revolving motions in opposite directions, the axes of rotation of the eccentric axle supporting means being so spaced from the axles that the axles move in orbits downwardly in the portions of the orbits facing each other whereby the lower ends of the tamping tools are vibrated in elliptical paths downwardly with respect to the track support point.

4,445,439

RAILROAD VEHICLE TRUCK WITH SINGLE WHEELSET

Lynn K. Tilly, West Chicago, and John J. Sawa, Chicago, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 14, 1981, Ser. No. 302,217
Int. Cl.[3] **B61F** *3/00, 5/22, 5/44*
U.S. Cl. 105—165 **6 Claims**



1. A truck for a railroad car, said truck having a pair of crosstie assemblies defined in part by a pair of endcaps, each of said endcaps having a center block operatively connected to a side frame of said truck by a swing arm and having at least two spring cups attached one each to each side of said center block, said spring cups operatively connected to a body of said railroad car by resilient means, an improvement in said endcap comprising:

inner and outer rib means joined to each said spring cup and

extending from said center block above and below said cups respectively to resist bending forces transferring between said center block and said spring cups,

transverse rib means joined to and extending across each said spring cup and located between said center block and an outermost edge point of said spring cup to resist torsional forces transferring between the center block and the spring cups,

said inner rib means joined to an inner flange of each said spring cup and said outer rib means joined to an outer edge of each said spring cup,

said inner rib means having an outer end located near said outermost edge of said spring cup and a top edge sloping upwardly from said outer end to an inner end flush with a top wall of said center block.

2. A truck for a railway car, said truck having a pair of crosstie assemblies defined in part by a pair of endcaps, each of said endcaps having a center block operatively connected to a side frame of said truck by a swing arm and having at least two spring cups attached one each to each side of said center block, said spring cups operatively connected to a body of said railroad vehicle by resilient means, an improvement in said endcap comprising:

inner and outer rib means joined to each said cup and extending from said center block above and below said cups respectively to resist bending forces transferring between said spring cups,

transverse rib means joined to and extending across each said spring cup and located between said center block and an outer edge of said spring cup to resist torsional forces transferring between the center block and the spring cups,

said outer rib means having an outer end located near said outer edge of said cup and a bottom edge sloping downward from said outer end to an inner end substantially flush with a bottom wall of said center block.

6. An end cap particularly adapted for being part of a crosstie assembly in a railroad vehicle truck with a single wheelset, an improvement of said end cap comprising,

a center block having a bottom wall formed with a downward concave shaped groove to form in part a lower pivot connection with a swing arm of said truck, and a pair of horizontal platforms attached to and extending outwardly respectively from each side of said center block, each said platform including a narrow partition located adjacent to said center block and joined integrally thereto and a circular cup portion connecting with said narrow partition,

an inner flange joined to and extending upwardly from and about an inner edge of each said horizontal platform,

an outer flange joined to and extending upwardly from and about an outer edge of said horizontal platform,

an inner rib formed on each said inner flange, said inner ribs having an outer end proximate to an outermost edge point of each said horizontal platform and an inner end joined to a front and a rear vertical sidewall of said center block respectively with said inner ribs having a top edge sloping upwardly from said outer end to said inner end to be substantially flush with a top wall of said center block,

an outer rib joined to and extending downward from and about said outer edge of each said horizontal platform, said outer ribs having an outer end proximate to said outermost edge point of each said horizontal platform and an inner end joined to said front and rear sidewall of said center plate respectively with said outer ribs having a botom edge sloping downward from said outer end to said inner end to be substantially flush with a bottom wall of said center block, and

a transverse rib formed on and extending upward from each said platform, each said transverse rib being proximately aligned with a joinder of said platform narrow partition and said platform circular cup portion with a top edge of each said transverse rib being substantially flush with a top edge of said outer flange at an outer end of said transverse rib, said top edge of said transverse ribs sloping upward from said outer ends to be substantially flush with said top edge of said inner ribs at an inner end of each said transverse rib with a longitudinal axis of each said transverse rib intersecting a longitudinal axis of said center block at a point proximate an outer end wall of said center block.

4,445,440

TRACK GUIDED VEHICLE

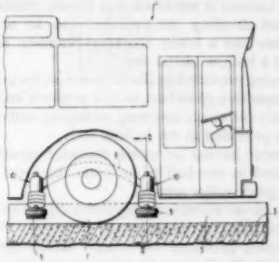
Sieghart Geiss, Remseck, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

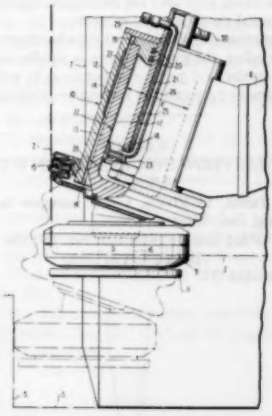
Filed Jan. 25, 1982, Ser. No. 342,667

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102094

Int. Cl.³ B61F 7/00; F01B 7/20, 31/06

U.S. Cl. 105—215 R **2 Claims**





1. A track guided vehicle comprising

at least one transverse guide roller means provided on respective lateral sides of the vehicle,

guiding means for mounting each of the transverse guide roller means for movement to and from a retracted position to an extended operating position laterally beyond an outside wall of the vehicle,

said guiding means including a first guide member and a hollow guide column axially displaceably and non-rotatably mounted in the first guide member and being connected by a bearing pin means to the transverse guide means associated therewith,

a bilaterally effective pneumatically operated cylinder and a piston accommodated in the cylinder accommodated in said hollow guide column for selectively displacing the

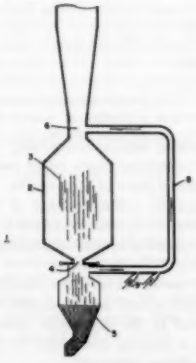
respective transverse guide roller means between the respective positions,
a support arm means being provided for mounting the respective guiding means at the vehicle,
said guiding means being mounted at an end of said support arm means so as to extend diagonally upwardly and in a direction towards an interior of the vehicle,
the first guide member being a guide bushing secured at the support arm means,
the cylinder being formed by a machined interior surface of the hollow guide column,
the interior of the hollow guide column having a round cross-sectional configuration,
removable cover means being provided for sealing an end of the hollow guide column opposite the transverse guide roller means,
the piston resting against a portion of said cylinder when the guide column is retracted to a lowest relative position,
the piston dividing the cylinder into an upper working chamber and a lower working chamber, said piston includes a hollow piston rod,
means being provided in the hollow rod for communicating the respective chambers with a pressure supply,
said means for communicating including individual channel means provided in the hollow rod,
the cylinder having an inside diameter generally between one-third to one-half of an outer diameter of the transverse guide roller means,
a further cover member being mounted on an upper end of the first guide member,
means being provided for axially fixing the piston with respect to the first guide member,
said means for axially fixing including the piston rod connected to the piston and extending through a central opening in the removable cover means,
seal means being provided for sealing the central opening in the removal cover means, whereby
upon pressurization of said working chambers with respect to each other, the guide column is axially displaced with respect to the first guide member so as to enable selective displacement between the respective positions.

4,445,441

SLAG TAP GAS FLOW INDUCEMENT IN WET-BOTTOM FURNACES

Michael C. Tanca, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 1, 1983, Ser. No. 500,118
Int. Cl.³ F23J *1/00*
U.S. Cl. 110—165 R **2 Claims**



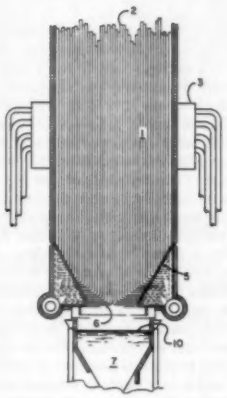
1. In a furnace space wherein combustion is sustained and from which the products of combustion primarily discharge upwardly through a throat with a high velocity which generates a low value of local pressure and from which a slag tap throat extends downward for draining molten slag from the furnace space,
a conduit connected at its first end with the low value local pressure area of the furnace throat and at its second end to the slag tap throat at a point below the entrance to the tap throat from the furnace space,
whereby the low pressure of the furnace throat causes a portion of the combustion products of high temperature to flow downwardly through the tap throat in contact with the slag draining through the tap throat to maintain the temperature of the slag high enough to preclude solidification which would impede flow of the slag from the furnace space.

4,445,442

FURNACE CONSTRUCTION HAVING AN ASH PIT WITH A RADIATION REFLECTING SURFACE

William H. Pollock, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 21, 1982, Ser. No. 435,782
Int. Cl.³ F23J *1/02*
U.S. Cl. 110—171 **2 Claims**



1. A solid fuel-burning furnace, including,
water walls forming a generating section,
at least one burner mounted through the water walls and arranged to sustain combustion of fuel and air in the generating section,
sloping sides depending from the generating section forming a Coutant transition section below the generating section to receive the residue from the combustion and terminating in a lower exit slot,
an ash pit mounted below the exit slot,
a body of water impounded in the ash pit with its surface below the exit slot,
and a plurality of hollow metallic balls having a specific gravity of less than 1 disposed in a layer over the surface of the impounded water providing a reflecting surface which will reflect incident radiation from the generating section back up into the generating section while permitting the passage of solid residue falling from the slot of the transition section into the body of impounded water.

4,445,443

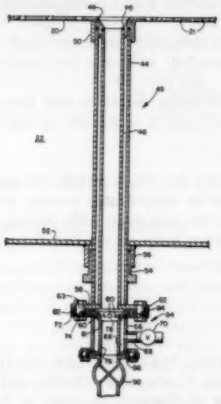
FLUIDIZED BED HEAT EXCHANGER HAVING SEPARATING DRAIN AND METHOD OF OPERATION THEREOF

Robert D. Stewart, Verona, and Thomas E. Taylor, Bergenfield, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation of Ser. No. 364,163, Mar. 31, 1982, abandoned, which is a continuation-in-part of Ser. No. 190,299, Sep. 24, 1980, Pat. No. 4,335,661. This application Oct. 17, 1983, Ser. No. 542,093

Int. Cl.³ F23G *7/00*

U.S. Cl. 110—245 **9 Claims**



1. In a fluidized bed heat exchanger having a perforated support plate to support a bed of particulate material including a fuel material and an adsorbent material, means for introducing air through the perforations to fluidize said particulate material, means for starting combustion in said bed by which relatively heavy fuel ash particles are formed, means for introducing additional particulate material to said bed, and a drain having an inlet in said bed for discharging spent particulate material from said bed, the improvement comprising:

separating means for retaining the adsorbent material particles in the fluidized bed and for permitting the relatively heavy fuel ash particles to fall into the drain, the separating means comprising means for providing a flow of air through said drain and into said bed sufficient to retain the adsorbent material particles in the fluidized bed, but insufficient to prevent the relatively heavy fuel ash particles from falling into the drain, the air flow providing means including an element connected to and annularly arranged with respect to the drain, the element having at least one perforation in communication with said drain, directing the flow of air through said drain, and means for allowing the relatively heavy fuel ash particles to pass.

7. A method of operating a fluidized bed having a perforated support plate and a drain comprising:

supplying particulate material to the fluidized bed, including a fuel material and an adsorbent material;

supplying fluidizing air to the fluidized bed through the perforated support plate;

starting combustion in the fluidized bed by which relatively heavy fuel ash particles are formed;

providing an annular element having a central aperture and at least one perforation in communication with said drain; and

discharging the fuel ash particles through the drain while retaining the adsorbent material in the fluidized bed, said discharging step comprising providing a flow of air into said drain through said perforation, through said drain and into the fluidized bed sufficient to retain the adsorbent material in the fluidized bed, but insufficient to prevent the relatively heavy fuel ash particles from falling into said drain.

4,445,444

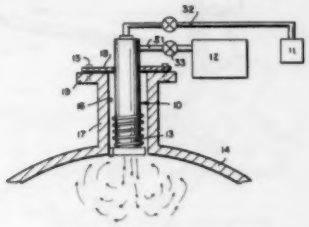
BURNER FOR COMBUSTING OXYGEN-COAL MIXTURE

Michael L. Espedal, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,397

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—261 **5 Claims**



1. A burner (10) for combusting a mixture of powdered hydrocarbon and a combustion supporting medium, to form a stream of a produced gas which burner comprises;

an elongated burner body (21) defining a mixing chamber (26) therein,

means communicating said mixing compartment with discrete sources of the powdered hydrocarbon (12) and the combustion supporting medium (11),

a peripheral lip (23) at one end of said elongated body (21) defining a discharge nozzle (28) which communicates with said mixing compartment (26), and through which lip (23) said stream of produced bgas issues,

said elongated burner body (21) including a face (24) disposed adjacent to the peripheral lip (23),

a manifold (37) disposed contiguous with said burner body (21), being spaced radially outward of said discharge nozzle lip (23) and communicated with a source of a pressurized fluid (38),

a plurality of constricted ports (43) formed in said manifold (37), being spaced radially apart, adjacent to said face, and aligned toward said peripheral lip (23) to direct a plurality of jets of said fluid from the manifold (37) toward the said peripheral lip (23),

whereby to form a dynamic, fluid barrier which extends transversely of the burner face (24) to avoid the deposition of ash particles on the said face.

4,445,445

APPARATUS FOR FERTILIZING SOIL WITH A V-BLADE PLOW

Richard L. Sterrett, P.O. Box 339, Quinter, Kans. 67752

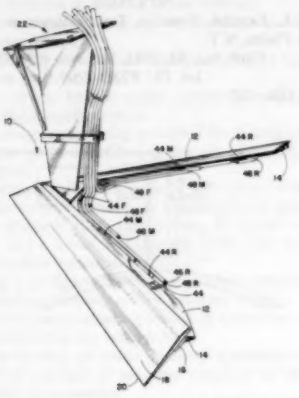
Filed May 28, 1982, Ser. No. 382,948

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—7 **6 Claims**

1. For use in combination with a V-blade plow having downwardly and forwardly-inclined angularly-disposed blades with leading edges for plowing and trailing edges elevated therebehind, the improved distribution system for placing two different types of liquid fertilizer into the freshly plowed ground and mixing same "in situ" which comprises: a first tubular member having an inlet connectable to a pressurized source of nitrogen-bearing fertilizer in liquid form, a horizontally-disposed portion fastened to the trailing edge of each plow blade in shielded relation therebehind, means defining a closure for the end of said horizontal portion remote from the

inlet, and at least two downwardly-directed discharge orifices for dispensing said nitrogen-bearing liquid fertilizer received from the pressurized source thereof directly into the plowed ground in transversely-spaced rows; and, other tubular members corresponding to each of the discharge orifices in the first



pipes connected alongside thereof in trailing relation thereto, said other tubular members each having an inlet connectable to an unpressurized source of phosphorous-bearing fertilizer in liquid form and a single outlet for dropping same onto the ground immediately behind and to the nitrogen-bearing fertilizer issuing from one of the orifices in the first tubular member.

4,445,446

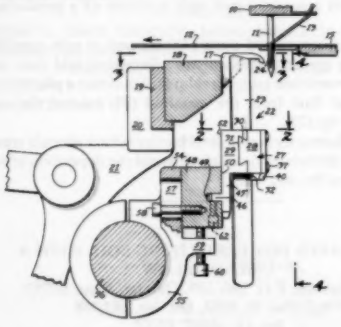
KNIFE HOLDER MODULE FOR CUT PILE TUFTING MACHINE

Max M. Beasley, Lookout Mountain, Ga., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Jan. 26, 1983, Ser. No. 445,236

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—79 R **13 Claims**



1. In a cut pile tufting machine having means for supporting a base fabric for longitudinal movement in a tufting direction through said machine, a plurality of transversely spaced reciprocal needles for introducing yarns through said base fabric to form loops, a looper hook for each needle on the opposite side of the base fabric from the needles and adapted to cooperate with a corresponding needle to seize and hold a yarn carried by the needle to form a loop, a cutting apparatus comprising:

(a) a knife holder module comprising a block member having front and rear portions and top and bottom faces,

(b) a plurality of elongated knife slots extending upright through said block member and opening through said top and bottom faces, each of said knife slots having a widthwise dimension extending front-to-rear of said block member,

(c) said block member comprising a front section and a rear section, said front section including front portions of said knife slots and having an extending locking member, said rear section including rear portions of said knife slots and having a cooperating locking member adapted to cooperate with said extending locking member in an operative position for securing said front and rear sections together to form a knife block member having corresponding knife slots, each of which completely surrounds and is in substantial solid contact with a corresponding knife received in said knife slot,

(d) a plurality of elongated knives, each knife being received in a corresponding knife slot for longitudinal slidable movement,

(e) adjustable securing means in said block member for engaging and holding each knife in said corresponding knife slot,

(f) a knife bar,

(g) means securing said block member on said knife bar,

(h) drive means for reciprocably moving said knife bar so that said knives cooperate with corresponding looper hooks for cutting loops on the looper hooks to form cut pile tufts.

4,445,447

TUFTING MACHINE APPARATUS

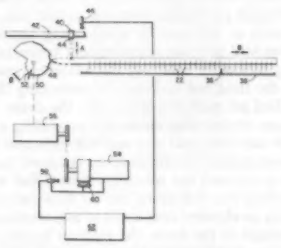
Harold B. Bardsley, Euxton, Near Chorley, and Ian Beverley, Blackburn, both of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Dec. 17, 1982, Ser. No. 450,652

Claims priority, application United Kingdom, Jan. 7, 1982, 8200452

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—79 R **20 Claims**



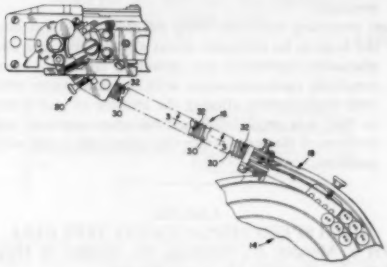
1. In a tufting machine having a reciprocable needle bar carrying a multiplicity of needles for penetrating a base material being fed through the machine and having means for mounting the needle bar for movement transverse to the direction the base material is fed, drive means for moving the needle bar transversely selectively to alter the location of the penetration of the base material by the needles, said drive means comprising, a peripheral cam having a plurality of discreet steps thereabout, means for operatively connecting said cam to said needle bar for drivingly moving said needle bar transversely in increments throughout a range of movements determined by said cam, cam drive means adapted selectively to drive said cam rotatably through a predetermined angle and in a selected direction, and first sensing means responsive to the cyclical position of the needles for energizing said cam drive means when said needles are in a retracted position relative to the base material.

4,445,448

APPARATUS FOR DELIVERING DISK-LIKE OBJECTS TO AN ATTACHING STATION

Roy W. Fletcher, Riverdale, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,158
Int. Cl.³ D05B *3/14*
U.S. Cl. 112—110 **10 Claims**



1. A button sewing station comprising:
a button hopper;
a button sewing machine having a receiving station;
a button chute disposed between said hopper and sewing machine, said chute having an open ended track defining a button delivery path, said track being heightwise dimensioned larger than the thickness of button being delivered to said button receiving station; and insertable means carried by said chute for restricting the heightwise dimension of said track thereby controlling the planar disposition of buttons as they travel along said track.

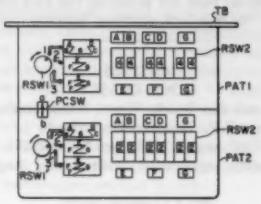
4,445,449

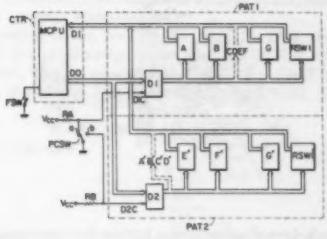
STITCH PATTERN SETTING APPARATUS FOR ELECTRICALLY DRIVEN SEWING MACHINE

Kaneharu Kuzuya, Anjo; Giichi Ishida, and Kosho Ishizaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Aisin Seiki Co., Ltd., both of Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,916
Claims priority, application Japan, May 20, 1981, 56-74869
Int. Cl.³ D05B *19/00, 3/02*
U.S. Cl. 112—121.11 **2 Claims**

1. An electrically driven sewing machine provided with means for selecting one of a plurality of stitch patterns and setting the numbers of stitches for respective pattern elements constituting the selected stitch pattern, wherein said means includes a plurality of stitch pattern setting units, each of said stitch pattern setting units including means for selecting the stitch pattern and means for setting the numbers of stitches included, respectively, in the pattern elements constituting said selected stitch pattern, independent of the other pattern setting units and means for selectively switching between the pattern





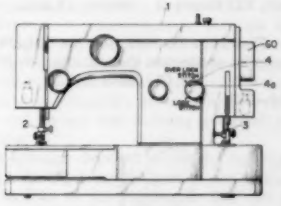
units during a sewing operation by the sewing machine so as to enable a change in the sewing patterns.

4,445,450

SWITCHING DEVICE OF DUAL FUNCTION SEWING MACHINE

Yoshikazu Ebata, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,815
Claims priority, application Japan, Aug. 5, 1981, 56-121889
Int. Cl.³ D05B *25/00*
U.S. Cl. 112—155 **6 Claims**



1. A switching device of a double-function sewing machine of the type including a machine frame, a flywheel having a shaft, a lock stitch forming mechanism having a main shaft and an overlock stitch forming mechanism, the device comprising a belt wheel bush which is notatable with respect to the machine frame and is driven by a driving source, said belt wheel bush having an end secured to the shaft of the flywheel; a ratchet guide member mounted on the main shaft of the lock stitch forming mechanism, said guide member being notatable with respect to the machine frame; a first sliding plate mounted on said ratchet guide member; a belt wheel for overlock stitching rotatably supported with respect to the machine frame and operatively connected to the overlock stitch forming mechanism; a second sliding plate mounted on said belt wheel; a switch lever which is operated from outside of the machine

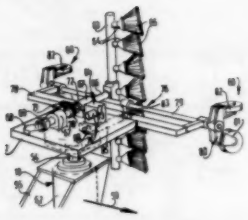
frame; and a pair of switching arms operatively connected to said switch lever and operated thereby such that said first sliding plate and said second sliding plate are alternatively held on said belt wheel bush for selecting the lock stitch forming mechanism or the overlock stitching forming mechanism.

4,445,451

DOCK DEVICE

Bernardus C. van den Broek, Weert, Netherlands, assignor to Stork Services B.V., Hengelo, Netherlands

Filed Aug. 5, 1981, Ser. No. 290,251
Claims priority, application Netherlands, Aug. 14, 1980, 8004610
Int. Cl.³ B63B *59/00*
U.S. Cl. 114—222 **13 Claims**



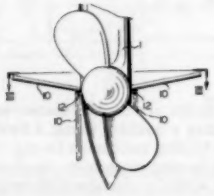
1. A dock device comprising a bottom for supporting a ship or the like and longitudinal walls standing up from the bottom, a carriage adapted to be moved by driving means along a longitudinal wall, an arm pivotably and deflectably connected with the carriage, swinging and deflecting means for moving the arm with respect to the carriage, a head carrying a processing member and being rotatably and tiltably connected with the free end of said arm and tilting and rotating means for moving said head with respect to the arm, characterized in that horizontal and vertical guide wheels to be alternately actuated by setting means are connected with the head, each of said wheels being journalled on said head about an axis which is fixed relative to such head.

4,445,452

HYDROFOIL ASSEMBLY

Joseph Loch, 823 Forest St., Ottawa, Ontario, Canada K2B 5P8

Filed Nov. 19, 1981, Ser. No. 323,134
Claims priority, application Canada, Dec. 19, 1980, 367168
Int. Cl.³ B63B *1/30*
U.S. Cl. 114—282 **11 Claims**



1. An hydrofoil assembly comprising: a pair of hydrofoils, and mounting structure for attaching said hydrofoils to a boat such that in an operative condition said hydrofoils are disposed below the working water line of the boat,

said mounting structure defining a pivotal mounting for each hydrofoil about a respective pivot axis which in the operative condition is disposed in a generally fore-and-aft orientation,

each hydrofoil being pivotable between a retracted position projecting downwardly from the respective pivot axis and an extended position projecting substantially laterally from the associated pivot axis and means preventing each said foil from pivoting upwardly beyond said extended position,

each said hydrofoil in the operative condition having a positive angle of attack with respect to the surrounding water such that in forward motion of the boat the water reacts with the hydrofoil to urge it towards said extended position,

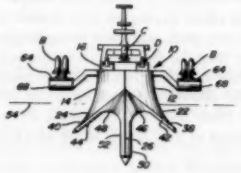
said mounting structure being adapted to be connected to the boat to be pivotable about a transverse axis and displaceable rearwardly and upwardly from said operative condition upon encounter with an underwater obstacle, such displacement altering the attitude of said hydrofoils so that said angle of attack becomes negative and the reaction of the water urges the hydrofoils to the retracted position.

4,445,453

HIGH SPEED DISPLACEMENT TYPE HULL

Albert E. Morgan, Jr., Honolulu, Hi., assignor to Hiram L. Fong, Jr., Honolulu, Hi., a part interest

Filed Mar. 17, 1982, Ser. No. 359,185
Int. Cl.³ B63B *1/32*
U.S. Cl. 114—290 **9 Claims**



1. A high speed displacement-type hull including opposite longitudinal upstanding outer sides and a single central depending transversely narrow longitudinal keel, the forward end portions of said outer sides and keel being directed inwardly and upwardly, respectively, and merging together to form a forwardly tapering bow, the lower marginal portions of said sides, rearward of said bow, terminating minating downwardly in downwardly and equally oppositely outwardly inclined elongated longitudinally extending and transversely narrow displacement-type cutwaters whose outer lower marginal portions are substantially longitudinally straight and rearwardly, downwardly and outwardly inclined, said cutwaters including generally parallel inwardly and outwardly inclined outer and inner side surfaces extending longitudinally thereof and which are slightly inwardly and upwardly divergent, said keel, rearward of said bow, including a rearwardly and downwardly inclined lower extremity extending longitudinally of said hull throughout a major portion of the length of said hull rearward of said bow and upstanding opposite side surfaces spaced inwardly of said inner side surfaces of said cutwaters, and generally semi-cylindrical downwardly opening tunnel roof surfaces disposed on opposite sides of said keel and extending longitudinally of said hull bridging the upper marginal portions of the pairs of corresponding inner and outer side surfaces, the uppermost central portions of said tunnel roof surfaces extending longitudinally of said hull and being generally longitudinally straight, the included angle between said cutwaters being greater than 90° and said keel being centered and equally angularly spaced between said cutwaters, said hull including a static water line spaced above said roof surfaces and through which the forward end portions of said outer marginal portions of said cutwaters extend, at least major rear portions of the lower marginal portions of said cutwaters being disposed beneath said static water line, all longitudinally

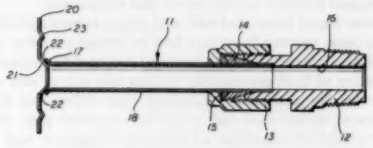
spaced portions of said keel being disposed at lower elevations than corresponding longitudinally spaced portions of said cutwaters.

4,445,454

TEMPERATURE SENSOR

Henry W. Martin, Houston, Tex., assignor to T. F. Hudgins & Associates, Inc., Houston, Tex.

Filed Feb. 12, 1982, Ser. No. 348,594
Int. Cl.³ G08B *17/00*
U.S. Cl. 116—106 **2 Claims**



1. In a fusible solder temperature sensor adapted for use with a trapped fluid pressure header alarm system for sensing temperature in a gaseous atmosphere, comprising:

a thermally insulating plastic fitting having thread means at one end thereof and a bore therethrough for connection to and in fluid communication with said header system;

a thin-walled metal tube connected at one end to the other end of said insulating plastic fitting for fluid communication therewith, and said tube having a radially outwardly flared portion at the other end thereof;

a metal closure disc releasably attached to and closing said other end of said tube, said closure disc having a surface area substantially larger than the cross-section area of said tube, and said disc having a frustoconical portion matching said flared end portion of said tube; and

a thin frustoconical layer of fusible solder spaced between said flared end portion of said tube and said frustoconical portion of said disc for releasably attaching said disc to said tube, said solder being responsive to ambient temperature above a predetermined level;

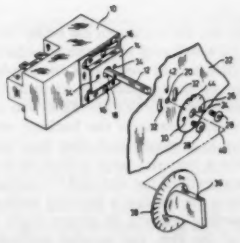
whereby said disc and said tube collect and transmit heat to thereby melt said solder when subjected to ambient temperature above said determined level to thereby release said closure disc from said tube causing release of trapped pressure in said header system to thereby generate a heat alarm signal.

4,445,455

DIAL ADJUSTMENT AND CALIBRATION OF OVEN CONTROL DEVICES

Trever E. Cannon, Georgetown, Canada, assignor to Camco Inc., Weston, Canada

Filed Sep. 22, 1982, Ser. No. 421,565
Int. Cl.³ G01K *15/00*
U.S. Cl. 116—216 **8 Claims**



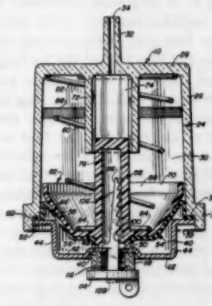
1. A temperature control device for regulating the operating temperature of a heating device to a predetermined temperature value, said temperature control device including an operating shaft adapted to pass through an aperture in a wall of said heating device and a knob attached to said operating shaft for adjusting by manipulation of said operating shaft said predetermined temperature value, cooperating indicating means on said wall and said knob, and means for mounting said temperature control device in a first fixed position relative to said wall, said means for mounting being adapted to be released to permit rotation of said temperature control device relative to said wall and for refixing said temperature control device in a second fixed position angularly displaced from said first position relative to said wall so as to provide for adjustment of the calibration of said temperature control device.

4,445,456

AIR FILTER RESTRICTION INDICATING DEVICE

Joseph N. Nelson, Waterloo, Iowa, assignor to Engineered Products Company, Waterloo, Iowa

Continuation of Ser. No. 131,456, Mar. 18, 1980, abandoned, which is a continuation of Ser. No. 11,410, Feb. 12, 1979, abandoned, which is a continuation of Ser. No. 916,776, Jun. 19, 1978, abandoned. This application Jun. 16, 1981, Ser. No. 273,699
Int. Cl.³ B01D *35/14*; G01L *7/08*
U.S. Cl. 116—268 **8 Claims**



1. An improved restriction indicating device for an air filter used with an internal combustion engine where the improved indicating device is in communication with the air flowing from the air filter to the air intake of the internal combustion engine, the improved indicating device comprising:

a housing having a first end, a second end, and a side wall that includes a transparent portion; the first end, the second end and the side wall defining an overall chamber in the housing;

a flexible diaphragm disposed within the housing, with the diaphragm having a central portion and having an edge portion secured to the housing so that the diaphragm divides the overall chamber into a first chamber, adjacent to the first end of the housing, and a second chamber, adjacent to the second end of the housing; the central portion of the diaphragm being movable between an infold position wherein it is more closely adjacent to the second end of the housing and an outfold position wherein it is more closely adjacent to the first end of the housing;

an indicating member that is disposed within the first chamber in the housing and that is carried by and movable with the diaphragm; the indicating member being visible through the transparent portion of the side wall of the housing at least as the diaphragm moves between its infold position and its outfold position;

means for permitting communication between the first chamber in the housing and the air flowing from the air filter to the air intake of the internal combustion engine;

means, including an opening in the second end of the hous-

ing, for permittng communication between the atmosphere and the second chamber in the housing;

a coil compression spring disposed in the first chamber of the housing, the compression spring being biased between the first end of the housing and the indicating member, with the bias of the compression spring being sufficient to move the diaphragm to its infold position when the vacuum in the first chamber is relatively low, as when a new air filter is initially used, but permitting the diaphragm to move from its infold position toward its outfold position in response to increases in the vacuum in the first chamber;

lock-up means for progressively locking the indicating member in the various positions which it attains within the first chamber as the diaphragm moves from its infold position to its outfold position and for maintaining the indicating member in its last such position even though there may thereafter be a subsequent decrease in the vacuum in the first chamber, the lock-up means including a tubular member carried by and movable with the central portion of the diaphragm, with the tubular member having a closed end that is adjacent to the first end of the housing and having an open end that is adjacent to the second end of the housing and that is in open communication with the second chamber; the lock-up means also including an elongated locking member having a first end and a second end, the locking member being supported by the second end of the housing so as to permit movement of the first end of the locking member between a first position and a second position; the first end of the locking member being disposed, when the first end of the locking member is in its first position, adjacent to the open end of the tubular member; the second end of the locking member projecting from the second chamber through the opening in the second end of the housing; the first end of the locking member and the open end of the tubular member having interengagable notches thereon that are adapted to be engaged when the first end of the locking member is in its first position, with engagement between the notches permitting the diaphragm to move from its infold position to its outfold position but preventing the diaphragm from returning to its infold position; and

means for selectively disengaging the interengagable notches so as to permit the diaphragm to return to its infold position when the vacuum in the first chamber is relatively low.

4,445,457

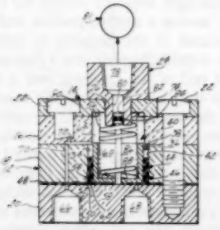
DIFFERENTIAL PRESSURE INDICATOR

Ronald D. Bargman, 1517 Ferris, Royal Oak, Mich. 48067

Filed Oct. 15, 1981, Ser. No. 311,779

Int. Cl.³ G01L *1/02*

U.S. Cl. 116—268 **5 Claims**



1. A differential pressure indicator for providing an indication upon detecting a predetermined differential pressure in a fluid system, comprising:

a housing having a bore formed therein;

a piston mounted for movement in said bore between a first and second position with a clearance space between said piston and bore;

a diaphragm mounted across said bore, said diaphragm formed with a rolling lip disposed within said clearance space;

means for applying said differential pressure across said diaphragm;

said piston drivingly engaged with said diaphragm for movement together with the central portion of said diaphragm, said rolling lip received over the outside of said piston;

bias means urging said piston to said first position with a force corresponding to the force generated by said predetermined pressure acting across said diaphragm;

indicator means associated with said piston providing indication upon moving from said first to second position, said indicator means including valve means enabling communication of fluid pressure applied on one side of said diaphragm by said means applying said differential fluid pressure across said diaphragm to an outlet port upon movement of said piston to said second position; and,

a pressure responsive indicator device responsive to development of said pressure at said outlet port;

whereby movement of said piston from said first to second position provides said indication of said development of said predetermined differential pressure by said response of said indicator device.

4,445,458

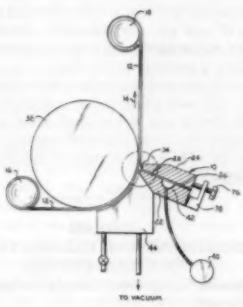
BEVELED EDGE METERED BEAD EXTRUSION COATING APPARATUS

William G. O'Brien, Towanda, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1982, Ser. No. 400,245

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—401 **7 Claims**



1. A metered bead extrusion coating apparatus for coating a fluid onto the surface of a web supported by a backing member comprising:

a wetdown die;

a drawdown die, the wetdown die being the first die in the direction of web travel while the drawdown die is the last die in the direction of web travel, the wetdown die and the drawdown die being spaced apart to define an extrusion slot therebetween, the slot having an axis extending therethrough which intersects the backing member, the slot terminating in a mouth such that fluid emanating therefrom forms a metered bead which bridges the gap between the mouth of the slot and the surface of the web;

the drawdown die having a beveled surface thereon, the beveled surface defining an obtuse angle with respect to the axis of the slot, the beveled surface being defined between a first edge adjacent to the mouth of the slot and a second edge, the shortest distance between the first edge and a reference line extending perpendicularly to the axis

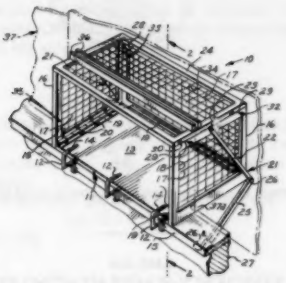
of the slot erected at the point on the axis where the axis intersects the backing member being greater than the shortest distance between the second edge and the reference line.

4,445,459

ANIMAL PET PORCH AND CONTAINER

Patricia Julie, 825 Harristown Rd., Glen Rock, N.J. 07452

Filed Apr. 20, 1983, Ser. No. 486,712
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—1 **4 Claims**



1. In a portable and disassemblable porch for pets adapted to be removably attachable to the sill of a window frame and to interfit and project beyond the opening of a standard window within said frame whereby to extend said opening, the improvement comprising in combination: an enclosure comprised of a base, a pair of side walls and a rear wall, said walls each being pivotally secured to and collapsible on said base; a top wall removably securable to said side and rear walls providing an entrance opening and for maintaining each of said walls in vertical and operative position; clamping means attached to said base for adjustable and releasable securement to the sill of the window frame; a pair of braces each being collapsible intermediate the ends thereof and each being pivotally secured at one end to each of said pair of side walls and each having means at the other end adapted to frictionally engage the building exterior wall below said window sill for cooperating with said clamping means in rendering said porch stationary within the window opening.

4,445,460

CROWD GATE FOR MILKING PARLOR

Gerald R. Stencil, Rte. 3, Denmark, Wis. 54208

Filed Apr. 13, 1981, Ser. No. 253,310
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—20 **8 Claims**

4. A crowd gate means for use in herding animals from an entry end of a holding area to the exit end of a holding area of the type in which a wheeled carriage, from which a pivoting gate is suspended into and generally spans the holding area, is moved along tracks above the holding area, the suspended gate herding the animals in the area before it, such gate being responsive to animal contact to stop movement of the carriage, such gate being adapted and used in association with gate raising means to raise the gate to a horizontal position for return of the carriage to the entry end of the herding area wherein the improvement comprises:

a gate mounting beam substantially spanning the holding area and pivotally mounted to the carriage;

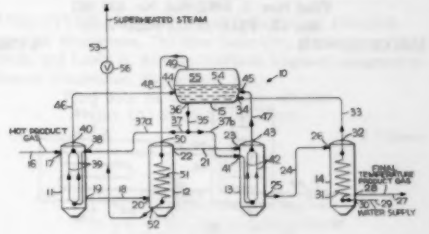
a partially counterweighted gate, fixedly mounted to the gate mounting beam other than at the center of mass of the gate mounting beam and on that side of beam opposite of the direction of forward travel of the carriage so that the lower edge of gate extends forward of an imaginary line normal to the floor of the holding area and passing through the center of mass of the gate mounting beam.

4,445,461

WASTE HEAT RECOVERY METHOD AND APPARATUS

Khosrow Farnia, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 14, 1982, Ser. No. 387,932
Int. Cl.³ F22D *1/00*
U.S. Cl. 122—7 R **9 Claims**



7. An apparatus for the recovery of heat from a flow of a gas having a first temperature in excess of a predetermined safety temperature at which a superheater is susceptible to damage from thermal shock when contacted by the gas at a time when said superheater is empty comprising, in operable combination:

(a) a first boiler operable to receive said flow of gas and flow of saturated water and further operable to indirectly heat said flow of saturated water with said flow of gas within said first boiler at a rate sufficient to convert and flow of saturated water to a flow of saturated steam and reduce the temperature of said gas flow to a secondary temperature below said safety temperature and above a temperature necessary to convert a flow of saturated steam to a flow of superheated steam within said superheater;

(b) said superheater operable to receive a flow of saturated steam and a flow of a gas of said secondary temperature and operable to indirectly heat said flow of saturated steam with said flow of secondary temperature gas within said superheater at a rate sufficient to convert said flow of saturated steam to a flow of superheated steam and reduce said temperature of said gas flow to a tertiary temperature;

(c) means for admitting a flow of said first temperature gas to said first boiler;

(d) means for supplying a flow of saturated water to said first boiler;

(e) means for passing said flow of saturated steam from said first boiler to said superheater;

(f) means for passing said flow of secondary temperature gas from said first boiler to said superheater;

(g) means for discharging said flow of superheated steam from said superheater;

(h) means for discharging said flow of tertiary temperature gas from said superheater;

(i) a second boiler operable to receive a flow of saturated water and operable to receive a flow of said tertiary temperature gas; said second boiler further operable to indirectly heat said saturated water with said flow of tertiary temperature gas within said boiler at a rate sufficient to convert said saturated water to saturated steam and re-

duce the temperature of said gas flow to a fourth temperature;

(j) means for admitting to said second boiler said flow of tertiary temperature gas discharged from said superheater;

(k) means for supplying to said second boiler a flow of saturated water;

(l) means for passing said flow of saturated steam from said second boiler to said superheater;

(m) means for discharging said flow of fourth temperature gas from said second boiler; and

(n) means intermediate said first boiler and said superheater and intermediate said second boiler and said superheater for drying said flows of saturated steam.

4,445,462

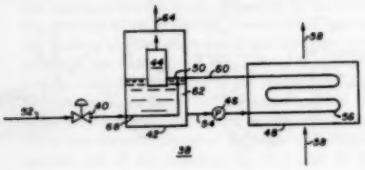
WASTE HEAT BOILER WITH FEED MIXING NOZZLE

Thomas P. Mastronarde, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 1, 1982, Ser. No. 437,983

Int. Cl.³ F22B *35/00*; F22D *1/00*

U.S. Cl. 122—7 R **6 Claims**



1. A device for attenuating cyclic thermal shrink and swell in the steam drum of a waste heat boiler embodying a steam drum, a steam generating bank and separating means all interconnected so as to collectively define a flow path through the waste heat boiler comprising a feed mixing nozzle including a first and a second inlet and an outlet, said first inlet being connected to the steam generating bank for receiving therefrom the output being discharged therefrom, said second inlet being connected in the path of flow of the input to the steam drum for receiving this input before the input is discharged into the steam drum, said feed mixing nozzle being operative to effect a combining therewithin of the input intended for the steam drum with the output discharged by the steam generating bank so as to effectuate a preheating of the input intended for the steam drum by the output from the steam generating bank, said outlet being connected to the separating means for discharging thereto the combined flow of the now preheated input intended for the steam drum and the output from the steam generating bank.

4,445,463

WASTE HEAT BOILER

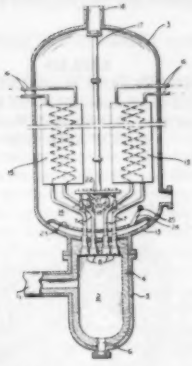
James R. Casper, and Harvey J. Hauer, both of Wilmington, Del., assignors to Syngas Company, Deer Park, Tex.

Filed Apr. 6, 1983, Ser. No. 482,595

Int. Cl.³ F22B *1/18*, *37/24*

U.S. Cl. 122—7 R **3 Claims**

1. In a vertical waste heat boiler having a vertical shell, extending through the bottom of the shell into the shell interior a plurality of entrance tubes, the entrance tubes connected to tubular means within the shell for heat exchange, the improvement comprising the entrance tubes having flared openings at their bottom end and a vertical support rod extended within the shell, the rod being attached at one end to the top of the shell and at the other end to the entrance tubes, at least part of the support rod being made of a material having a lower coefficient of thermal expansion than the material used for the boiler shell.



4,445,464

HIGH EFFICIENCY WATER HEATING SYSTEM

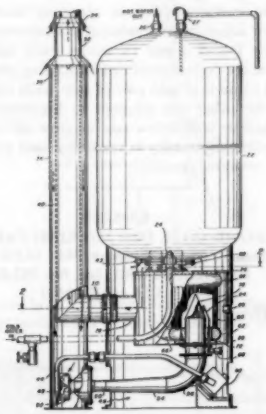
Joseph Gerstmann, Framingham, and Andrew D. Vasilakis, Bedford, both of Mass., assignors to Advanced Mechanical Technology, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 149,937, May 14, 1980, Pat. No. 4,338,888. This application Jul. 12, 1982, Ser. No. 397,081

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—16 **3 Claims**



1. A storage water heater of the type having an insulated water storage tank, a water inlet and a water outlet to and from the water heater, and a gas fueled combustion assembly in which gas initially at line pressure or less mixes with combustion air without power assist and is ignited in a combustion chamber to heat water in the storage tank, the water heater comprising:

aspirator/mixer assembly means comprising a venturi mixer tube a diffuser at the outlet of the mixer tube, an air inlet to the mixer tube and a fuel gas nozzle at the inlet for receiving fuel gas at line pressure of 6.5 mm Hg or less and forming a gas jet to draw air through the inlet to mix with

the gas in the mixer tube, such that gas initially at line pressure of 6.5 mm Hg or less aspirates and mixes with an amount of air sufficient for complete combustion of the gas;

a combustion chamber substantially closed to the surrounding environment except through an exhaust flue and the aspirator/mixer assembly means such that all air combusted in the combustion chamber enters the combustion chamber with the fuel gas through the aspirator/mixer assembly; and

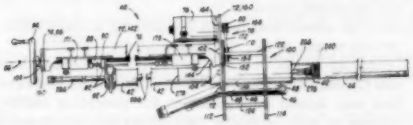
burner means within the combustion chamber for receiving the premixed gas/air mixture from the preceeding aspirator/mixer assembly to substantially completely combust the gas/air mixture within the chamber, the combustion chamber being in heat exchange relationship with the water in the storage tank.

4,445,465

SLUDGE LANCE ADVANCING APPARATUS

Audis C. Byrd; Bradley L. Todd, and William W. Pattison, Jr., all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 24, 1983, Ser. No. 478,404
Int. Cl.³ F22B *37/52*
U.S. Cl. 122—392 **20 Claims**



1. A sludge cleaning lance advancing apparatus, comprising:

a frame;

a lead screw rotatably disposed in said frame;

an electric stepping motor connected to said frame;

drive means, connected between said stepping motor and said lead screw, for rotating said lead screw upon rotation of a shaft of said stepping motor;

a lance carrier having an internal screw thread engaging said lead screw, said lance carrier and said lead screw being so arranged and constructed that said lance carrier is moved longitudinally relative to said lead screw as said lead screw is rotated relative to said lance carrier;

a lance, carried by said lance carrier; and

a hand wheel means attached to said lead screw, for manually rotating said lead screw to initially position said lance.

4,445,466

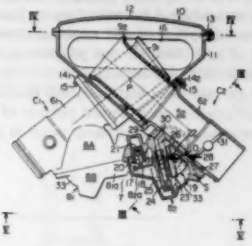
CARBURETION SYSTEM FOR V-TYPE INTERNAL COMBUSTION ENGINES

Katsuyuki Zaita, Kawagoe, and Suminari Iwao, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,368
Claims priority, application Japan, Jul. 10, 1981, 56-103345[U]; Aug. 20, 1981, 56-130611; Dec. 28, 1981, 56-213220
Int. Cl.³ F02B *75/20*
U.S. Cl. 123—59 PC **13 Claims**

1. In a carburetion system for a V-type internal combustion engine having a first carburetor and a second carburetor disposed in a space between a first cylinder and a second cylinder arranged in a form like V and adapted for supplying air-fuel mixture to respective cylinders independently,

the improvement wherein said carburetors have intake barrels which define there intake passages communicating with the associated cylinders, said intake barrels being disposed in the close proximity of each other and extend substantially at right angle to the axes of the associated



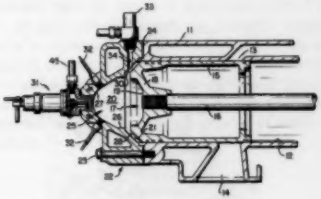
cylinder into a common intake box in which inlet opening side portions of the intake barrels cross each other.

4,445,467

TWO-CYCLE STRATIFIED CHARGE GAS ENGINE

Howard G. Westerman, 743 Blue Lake Cir., Richardson, Tex. 75080, and Lewis E. Allsopp, Stafford, England, assignors to Howard Westerman, Richardson, Tex.

Filed Aug. 10, 1982, Ser. No. 406,826
Int. Cl.³ F02B *23/00, 75/02*
U.S. Cl. 123—65 R **8 Claims**



1. A two-cycle, stratified charge unthrottled air, gas-powered engine comprising:

an engine block;

at least one cylinder bore in said engine block;

a piston slidably mounted in said cylinder bore having a crown thereon;

a cup-shaped, flat-bottomed recess formed in said crown having a diameter substantially less than the diameter of said crown;

a head mounted on said engine block; and

a deep, ovate-shaped chamber formed in said head; said chamber having a diameter substantially less than the diameter of said cylinder bore whereby said recess and said chamber cooperate to form a combustion chamber therebetween when said piston is at top dead center in said cylinder bore wherein said combustion chamber is substantially as long as it is wide.

8. A head for a two-cycle, stratified charge, unthrottled air, gas-powered engine comprising:

a head adapted to be mounted on an engine block to close a cylinder bore therein;

a deep, ovate-shaped combustion chamber formed in said head at a position wherein said chamber will open into said cylinder bore when said head is in an operable position on said block, said combustion chamber having a diameter substantially less than the diameter of said cylinder bore and having a lower cylindrical portion and an integral upper ovate-shaped domed portion;

a tapered surface on said head extending downwardly and outwardly from the bottom periphery of said lower cylin-

drical portion of said ovate-shaped chamber to a point adjacent the periphery of said cylinder bore when said head is in an operable position on said block;

means on said head for mounting an injector valve into the uppermost point of said upper ovate-shaped domed portion of said chamber at a position as near to said uppermost point as is practical, and

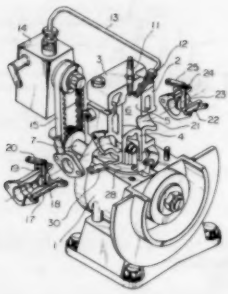
means on said head for mounting ignition means into said upper ovate-shaped domed portion of said chamber at a point as near said uppermost point as is practical.

4,445,468

2-STROKE INTERNAL COMBUSTION ENGINE AND AN IGNITION-COMBUSTION METHOD OF AN INTERNAL COMBUSTION ENGINE

Sigeru Onishi, Kanazawa, and Souk H. Jo, Tokyo, both of Japan, assignors to Nippon Clean Engine Research Institute Co., Ltd., Kanazawa, Japan

Filed Jul. 13, 1982, Ser. No. 397,788
Claims priority, application Japan, Oct. 23, 1981, 56-170475
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 C **26 Claims**



1. An ignition-combustion method of an internal combustion engine comprising a combustion chamber, a fuel injector arranged in the combustion chamber, an air-inlet port for feeding fresh air into the combustion chamber, and an exhaust gas-outlet port for discharging exhaust gas from the combustion chamber, said method comprising the steps of:

discharging the exhaust gas from the combustion chamber via the exhaust gas-outlet port while retaining a large amount of residual gas, containing unburned components, incompletely burned components and oxygen therein, in the combustion chamber;

gently feeding the fresh air into the combustion chamber from the air-inlet port while suppressing disturbance of the residual gas for continuing the oxidizing reaction of the unburned components and the incompletely burned components;

injecting fuel into the combustion chamber from the fuel injector to form a combustible mixture consisting of fuel and fresh air; and

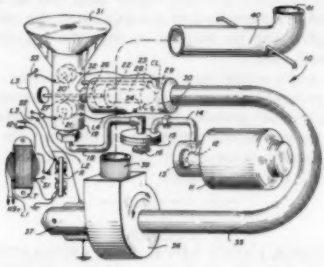
compressing the residual gas and said combustible mixture in the combustion chamber to accelerate the oxidizing reaction and bring about self-ignition of the residual gas, which self-ignited residual gas in turn ignites said combustible mixture.

4,445,469

ENGINE HEATER

Louis Suhayda, 1310 Park Dr., Montgomery, Ill. 60538

Filed Apr. 5, 1982, Ser. No. 365,375
Int. Cl.³ F02N *17/02*
U.S. Cl. 123—142.5 R **1 Claim**



1. An engine heater comprising:

A. heating means for producing a heated gas, said heating means being operable only on d.c.;

B. first connecting means, for making a connection to a first source of voltage which provides a d.c. electrical voltage not exceeding about 20 V.;

C. second connection means for making a connection to second source of a.c. electrical voltage;

D. coupling means, couple between (1) said heating means and (2) said first and second connecting means and having first and second configurations for providing electrical voltage at said particular time to set heating means (a) when said first configuration and when said first connecting means has made a connection to said first source of electrical voltage and (b) when said second configuration and when said second connecting means has made a connection to said second source of electrical voltage;

E. said first source of electrical voltage having a lesser absolute magnitude than said second source of electrical voltage and said coupling means, when in said first configuration, directly passing the electrical voltage from said first source to said heating means;

F. Said coupling means including rectifying means coupled, when said coupling means is in said second position, between said second connecting means and said heating means;

G. Said second source providing an a.c. electrical voltage having a magnitude greater than about 100 volts;

H. An internal battery capable of storing a voltage equal in magnitude to said first source of electrical voltage and said coupling means, when in said first position, providing the voltage from said internal battery to said heating means;

I. Charging means, coupled to said rectifying means for providing a d.c. voltage about equal to said electrical voltage of said first source, when said coupling means is in said second setting, to both said internal battery and to said first connecting means;

J. A pilot light operable upon a flammable fluid and an ignition coil operable on said particular type of voltage for selectively igniting said pilot light;

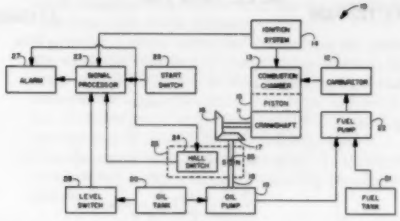
K. Igniting means for causing the ignition of a flammable fluid and fan means for moving the combustion products of the ignition of said flammable fluid to a desired location; and

L. A first valve means, operable upon said electrical voltage of said particular type, for selectively permitting and prohibiting the passage of said flammable fluid to said pilot light and second valve means, operable upon said electrical voltage of said particular type, for selectively permitting and prohibiting the passage of said flammable fluid to said igniting means.

4,445,470
OIL INJECTION WARNING SYSTEM

Cary J. Chmielewski, North Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 27, 1982, Ser. No. 453,652
Int. Cl.³ F02B 77/08
U.S. Cl. 123—196 S 10 Claims



1. An alarm system for a two-cycle internal combustion engine using a mechanically driven oil pump to provide oil from an oil reservoir to said engine for engine lubrication, said alarm system comprising:

(A) an alarm means;

(B) a means to sense the operation of said oil pump and provide a signal indicative of the speed of operation of said pump;

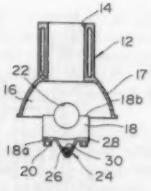
(C) a means to sense to operation of said engine and provide a signal indicative of the speed of operation of said engine; and

(D) a signal processing means connected to receive said pump signal and said engine signal and produce an alarm signal to activate said alarm if said pump and engine signals differ from a predetermined relationship.

4,445,471
LOW NOISE LEVEL AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 14, 1981, Ser. No. 302,236
Claims priority, application Japan, Sep. 17, 1980, 55-131883[U]
Int. Cl.³ F02F 7/00; F02B 77/00
U.S. Cl. 123—198 E 10 Claims



1. An automotive internal combustion engine comprising:

a cylinder block having a plurality of mean bearing carrying sections;

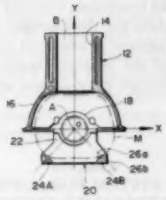
a plurality of main bearing caps secured respectively to said main bearing carrying sections to define a cylindrical opening for receiving a crankshaft, and

a beam member comprising a metal section secured to said bearing caps to rigidly connect said bearing caps, said beam member having a bend to improve the flexural rigidity of said beam member.

4,445,472
INTERNAL COMBUSTION ENGINE WITH BEARING BEAM STRUCTURE

Naoki Ogawa, Yokohama, and Toshiro Abe, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 10, 1981, Ser. No. 329,508
Claims priority, application Japan, Dec. 12, 1980, 55-175512
Int. Cl.³ F02F 7/00; F02B 77/00
U.S. Cl. 123—198 E 12 Claims



1. An internal combustion engine comprising:

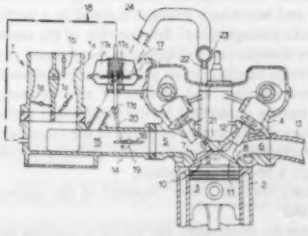
a cylinder block having a plurality or cylinder bores and a plurality of bearing sections located below said cylinder bores;

a bearing beam structure secured to the bottom part of said cylinder block and including a plurality of main bearing cap sections each of which is associated with a bearing section of said cylinder block to rotatably support the journal of a crankshaft, and first and second beam sections for securely connecting all said main bearing cap sections, said first and second beam sections extending parallel with the axis of the crankshaft and being located spacedly along the opposite side portions, respectively, of each bearing cap section.

4,445,473
CONTROL OF CARBURETOR-SUPPLIED INDUCTION SYSTEM

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 896,082, Apr. 13, 1978, abandoned, which is a continuation of Ser. No. 838,353, Sep. 30, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,915
Int. Cl.³ F02M 25/06
U.S. Cl. 123—308 68 Claims



1. In combination with an internal combustion engine of the type which includes a variable volume chamber in which combustion occurs, a charge forming device adapted to issue an air/fuel mixture to said chamber, a principal induction passage for delivering a charge to said chamber, a principal throttle valve in said principal induction passage for controlling the flow therethrough, an auxiliary throttle valve in said principal induction passage between said principal throttle valve and said chamber, an auxiliary induction passage extend-

ing from a point in said principal induction passage between the said throttle valves and discharging a charge into said chamber to cause the said charge from said auxiliary induction passage to be turbulent in said chamber; the improvement comprising actuator means to control the position of said auxiliary throttle valve, closure of said auxiliary throttle valve means being effective to divert at least a portion of the charge to said chamber through said auxiliary induction passage, said actuator means being responsive to the pressure in said principal induction passage between said throttle valves, said closure occurring at low-load conditions whereby the substantial portion of air/fuel mixture for the chamber flows through said auxiliary induction passage at low load conditions, the effective cross-section of the auxiliary induction passage being smaller than the effective cross-section area of the principal induction passage.

4,445,474

AIR INTAKE SYSTEM FOR SUPERCHARGED AUTOMOBILE ENGINE

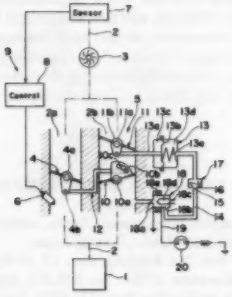
Masami Nakao; Haruo Okimoto; Yoshikuni Yada, and Junki Takeshita, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 3, 1982, Ser. No. 446,700

Claims priority, application Japan, Dec. 11, 1981, 56-200733

Int. Cl.³ F02M *11/04*

U.S. Cl. 123—336 **6 Claims**



1. An air intake system for a supercharged internal combustion engine having a supercharger disposed on an air intake passage means, which system comprises, in combination:

primary and secondary passages formed in a portion of the air intake passage means downstream of the supercharger;

a primary throttle valve disposed in the primary passage and operatively coupled to an accelerator pedal such that the selective opening and closure of said primary throttle valve can be controlled by the accelerator pedal;

a secondary throttle valve disposed in the secondary passage and operatively coupled to the primary throttle valve through a linkage mechanism;

an auxiliary throttle valve disposed in the secondary passage; and

an actuator for controlling the selective opening and closure of the auxiliary throttle valve in dependence on the suction pressure of air being sucked at a position downstream of the primary throttle valve or the throttle valves in the secondary passage, said actuator including means operable to gradually open the auxiliary throttle valve with increase of said suction pressure when and so long as the load on the engine is smaller than a predetermined medium load and to maintain the auxiliary throttle valve in a full open position when the load on the engine is equal to or larger than the predetermined medium load.

4,445,475

ENGINE IDLING SPEED CONTROL SYSTEMS

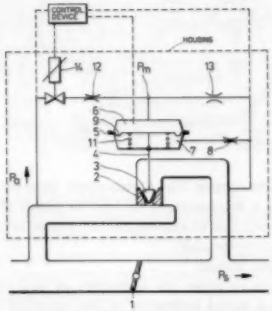
Hans Baumgartner, Viersen, and Eckehard Schmitz, Krefeld, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,829

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039613

Int. Cl.³ F02M *3/06*

U.S. Cl. 123—339 **17 Claims**



1. A system for controlling the idling rotational speed of a reciprocating internal combustion engine of the spark ignition type and having a throttle valve for controlling the air intake of the engine, said system comprising means defining a passage bypassing said throttle valve to allow a secondary flow of air to said engine, a valve disposed in said bypass passage for controlling the flow rate of the secondary air flow through said passage, and combined pneumatic and electronic control means for controlling the opening and closing of said bypass valve, said bypass valve comprising a Laval nozzle.

4,445,476

RPM GOVERNOR OF A FUEL INJECTION PUMP

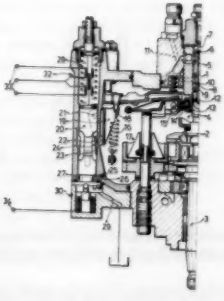
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,405

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121107

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—387 **5 Claims**



1. In an rpm governor of a fuel injection pump for internal combustion engines, including a housing, an adjustable stop for limiting the maximum injection quantity (full load), a piston in said housing which is hydraulically displaceable counter to a restoring force for varying the position of the stop, said piston

having only one end thereof which is exposed to fluid within a work chamber, an inflow conduit in said housing through which fluid from a fluid source flows into said work chamber and pressure control means for controlling the pressure of the fluid within the work chamber, the improvement including:

a throttle disposed in the inflow conduit for restricting fluid flow into said work chamber from said fluid source;

a fluid outflow conduit in said housing extending from said work chamber to a fluid return line for permitting fluid flow from said work chamber,

said pressure control means for controlling the pressure in the work chamber is a magnetic valve which is disposed relative to said outflow conduit extending from said work chamber for controlling fluid flow from said work chamber in accordance with load and rpm of an engine to determine a full load injection quantity, and

an electric travel path transducer which is connected with an electronic control unit for measuring the stroke of the piston.

4,445,477

METHOD AND APPARATUS FOR IGNITION SYSTEM SPARK TIMING CONTROL DURING NO-LOAD ENGINE OPERATION

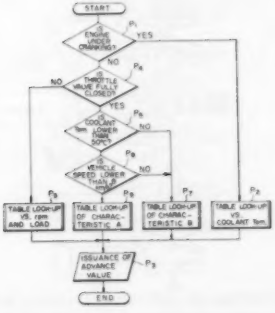
Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 379,033, May 17, 1982, abandoned, which is a continuation of Ser. No. 136,996, Apr. 3, 1980, abandoned. This application Jun. 17, 1983, Ser. No. 504,245

Claims priority, application Japan, Apr. 9, 1979, 54-45281

Int. Cl.³ F02D *5/00*; **F02B** *3/00*

U.S. Cl. 123—416 **14 Claims**



1. A method for the control of an ignition system spark timing for a spark ignition internal combustion engine for an automotive vehicle, said method comprising:

a step of detecting a condition that the engine is under cranking to provide a cranking signal indicating that the engine is under cranking;

a step of detecting a condition that said engine is in operation with no load to provide a no load indicative signal indicating that said engine is in operation with no load;

a step of detecting the engine temperature of said engine to provide a temperature signal indicating that the engine temperature is higher than a predetermined engine temperature value;

a step of detecting the vehicle speed of said automotive vehicle to provide a vehicle speed signal indicating that the vehicle speed is higher than a predetermined vehicle speed value;

a step of determining a value of spark advance vs. engine speed from a first predetermined spark advance characteristic of a plurality of spark advance vs. engine speed values in response to the absence of said cranking signal, the presence of said no load indicative signal, the absence of said temperature signal, and the presence of said vehicle speed signal; and

a step of determining a value of spark advance from a second predetermined spark advance vs. engine speed characteristic of a plurality of values of spark advance vs. engine speed values in response to to the absence of said cranking signal, the presence of said no load indicative signal, the presence of said temperature signal, and the absence of said vehicle speed signal,

said second predetermined spark advance vs. engine speed characteristic being a delayed spark advance characteristic and distinct from said first predetermined spark advance vs. engine speed characteristic; and

a step of producing a spark in accordance with that value of spark advance which has been determined for at least the detected temperature and vehicle speed of such vehicle by said determining steps.

4,445,478

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

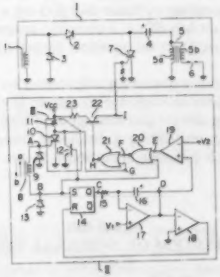
Tsutomu Momoyama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 239,206, Mar. 3, 1981. This application Mar. 28, 1983, Ser. No. 479,798

Claims priority, application Japan, Mar. 3, 1980, 55-27060; Mar. 3, 1980, 55-27061; Apr. 9, 1980, 55-47723; Apr. 9, 1980, 55-47724

Int. Cl.³ F02P *5/08*

U.S. Cl. 123—418 **6 Claims**



1. An ignition timing control system for internal combustion engines comprising:

angular signal generating means for generating an angular signal in synchronism with the revolutions of the engine at a predetermined crank position;

a single integrator means whose input is connected to said generating means for receiving said angular signal;

means for initiating a discharge mode of said integrator means, with a constant current output;

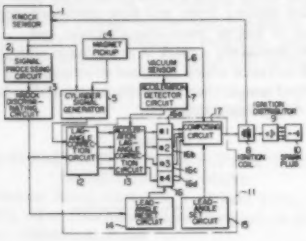
means for operating said integrator, with a constant current output, when the output of said integrator in the discharge mode reaches a first predetermined value thereby generating alternate charge and discharge outputs to form a triangular wave form output;

circuit means for generating a trigger output signal when said charge output reaches a second predetermined value.

4,445,479
IGNITION TIMING CONTROL APPARATUS WITH KNOCK SENSOR

Eiji Takakuwa, Okazaki; Kazumi Nakano, and Izumi Kizitani, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 14, 1982, Ser. No. 398,273
Claims priority, application Japan, Jul. 17, 1981, 56-111593
Int. Cl.³ F02P 5/14
U.S. Cl. 123—425 **5 Claims**



1. An ignition timing control apparatus for a multi-cylinder engine comprising:

a setting device for setting a predetermined reference ignition timing common to all cylinders under a normal driving condition in which no knock occurs;

a knock sensor for producing an output signal when a knock occurs at least in one of said cylinders;

a cylinder discriminating device for discriminating a cylinder under combustion;

an ignition lead-angle correction device for calculating an ignition lead-angle correction amount in response to output signals from said knock sensor and said cylinder discriminating device such that each time said knock sensor generates an output signal, said ignition lead-angle correction device generates a signal for making a lag-angle correction by a certain amount of $\Delta\theta_1$ to an ignition timing of a knock-occuring cylinder and making a lag-angle correction by $K_1 \times \Delta\theta_1$ (K_1 is a constant correction coefficient, and $0 < K_1 < 1$) to the ignition timing of the other cylinders; and

an ignition timing device for calculating an ignition timing of each cylinder in response to output signals from at least said setting device and said ignition lead angle correction device and controlling a discharge timing of the ignition coil of each cylinder in response to the result of calculation.

4,445,480
INTAKE SYSTEM OF INTERNAL COMBUSTION ENGINE

Mitsumasa Inoue, Yokohama; Ken Nakamura, Kawasaki; Junichi Yokoyama, Ebina, and Atsushi Yonezawa, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

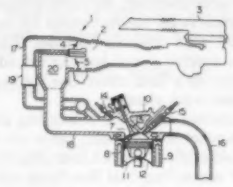
Filed Jan. 25, 1983, Ser. No. 460,899
Claims priority, application Japan, Feb. 15, 1982, 57-18545[U]
Int. Cl.³ F02M 31/00
U.S. Cl. 123—432 **4 Claims**

1. An intake system of an internal combustion engine including a power cylinder having an intake valve and a fuel injection nozzle, comprising

a throttle chamber upstream open to the atmosphere;

primary and secondary throttle valves provided in parallel with each other in said throttle chamber;

primary and secondary air passageways leading from the throttle chamber past the primary and secondary throttle valves, respectively, and conjoined together upstream of said intake valve, the secondary air passageway being larger in cross sectional area than the primary air passageway and having a reservoir chamber portion larger in cross sectional area than the remaining portion of the secondary air passageway; and

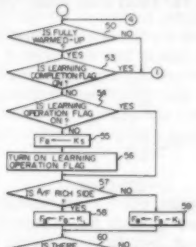


air heating means provided to the primary air passageway and operative to preheat the air to be passed through the primary air passageway.

4,445,481
METHOD FOR CONTROLLING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, and Toshiyuki Takimoto, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 22, 1981, Ser. No. 333,568
Claims priority, application Japan, Dec. 23, 1980, 55-181210
Int. Cl.³ F02M 17/00
U.S. Cl. 123—440 **7 Claims**



1. A method for controlling an air-fuel ratio of an internal combustion engine having a sensor means for detecting whether the air-fuel ratio is rich or lean with respect to a stoichiometric condition and producing an air-fuel ratio signal indicative thereof, said method comprising the steps of:

detecting an operating condition of the engine and producing an engine parameter signal indicative thereof;

controlling, in response to the engine parameter signal and the air-fuel ratio signal, by a closed loop control operation, the fuel feeding rate to the engine only when the engine is operated under a first predetermined operating condition, said closed loop control step including the steps of: calculating a feedback correction factor related to the fuel feeding rate depending upon the air-fuel ratio signal; correcting the fuel feeding rate to the engine in accordance with the calculatd feedback correction factor, so as to control the air-fuel ratio condition of the engine substantially close to the stoichiometric condition and adjusting a learning control correction factor so as to settle said feedback correction factor within a predetermined range while at the same time maintaining the air-fuel ratio condition of the engine close to the stoichoimetric condition the

adjusting of the learning control correction factor including the steps of calculating the mean value of the feedback correction factor; and adjusting a learning control correction factor so as to settle the mean value within a predetermined range while at the same time maintaining the air-fuel ratio condition of the engine close to the stoichiometric condition; and

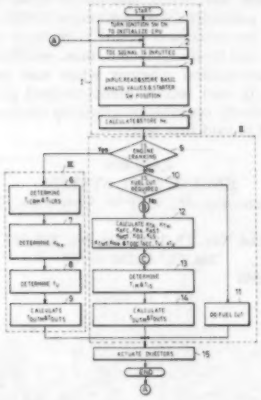
controlling, in response to the engine parameter signals and the adjusted learning control operation factor, by an open loop control operation, the fuel feeding rate of the engine, so as to maintain the air-fuel ratio condition of the engine at a desired condition which is different from the stoichiometric condition, after the closed loop control operation is completed.

4,445,482

AIRFUEL RATIO FEEDBACK CONTROL SYSTEM ADAPTED TO OBTAIN STABLE ENGINE OPERATION UNDER PARTICULAR ENGINE OPERATING CONDITIONS

Shumpei Hasegawa, Niiza, and Noriyuki Kishi, Itabashi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,106
Claims priority, application Japan, May 15, 1981, 56-72991
Int. Cl.³ F02M *51/00*; F02D *5/00*
U.S. Cl. 123—489 **22 Claims**



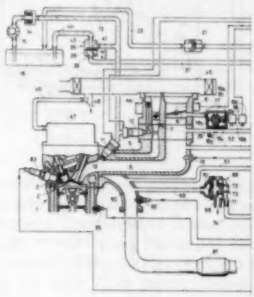
16. A control system for controlling the air/fuel ratio of an air/fuel mixture for an internal combustion engine having an exhaust system, comprising: a sensor arranged in said exhaust system for detecting the concentration of exhaust gases emitted from said engine; means for detecting a plurality of particular operating conditions of said engine; means for determining a basic value of the air/fuel ratio for at least one engine operating condition; and electric circuit means responsive to outputs of said exhaust gas concentration sensor and said particular operating condition detecting means to generate a first coefficient variable in response to the output of said exhaust gas concentration sensor and at least one second coefficient variable in response to the output of said particular operating condition detecting means, said first and second coefficients being applied for correction of said basic values, said electric circuit means including means operable when said engine is operating in an operating condition other than said particular operating conditions, to vary the value of said first coefficient in response to the output of said exhaust gas concentration sensor and simultaneously hold the value of said second coefficient at a first predetermined value, means for calculating a mean value of said varying first coefficient, and means operable when said engine is operating in one of said particular operating conditions, to hold the value of said second coefficient at a second predetermined value and simultaneously hold the value of said first coefficient at a third predetermined value being said mean value.

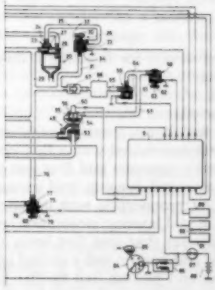
4,445,483

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING A FUNCTION OF LEANING MIXTURE IN AN ENGINE LOW LOAD REGION

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,648
Claims priority, application Japan, Feb. 20, 1981, 56-023994
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—492 **10 Claims**





1. In a fuel supply control system including fuel quantity adjusting means for controlling the quantity of fuel being supplied to an internal combustion engine having an intake pipe, wherein said fuel quantity adjusting means is electrically controlled in response to operating conditions of said engine to obtain a desired quantity of fuel being supplied to said engine, the combination comprising a sensor for detecting the rotational speed of said engine, a sensor for detecting absolute pressure in said intake pipe of said engine, said absolute pressure sensor being operable independently of changes in atmospheric pressure surrounding said engine, and means responsive to outputs of said sensors to cause leaning of an air/fuel mixture being supplied to said engine, said mixture leaning means being adapted to cause said fuel quantity adjusting means to lean said mixture when said engine is operating in a predetermined low load condition where the actual rotational speed of said engine detected by said engine rotational speed sensor is higher than a predetermined rotational speed which is higher than a possible upper limit of idling rpm and the actual absolute pressure in said intake pipe detected by said absolute

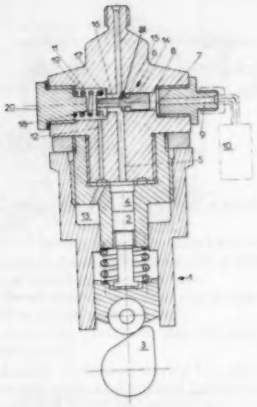
pressure sensor is lower than a predetermined absolute pressure which cannot be assumed during rapid acceleration of said engine from an idle state thereof when the actual rotational speed of said engine is higher than said predetermined rotational speed.

4,445,484

MECHANICAL FUEL INJECTION DEVICES, MAINLY FOR DIESEL ENGINES

Gerard Marion, Rhone, France, assignor to Renault Vehicules Industriels, Rhone, France

Filed Apr. 30, 1981, Ser. No. 259,282
Claims priority, application France, Apr. 30, 1980, 80 10121
Int. Cl.³ F02D *1/06*; F02M *47/00*
U.S. Cl. 123—502 **11 Claims**



1. An injection device for injecting a fluid, said injection device comprising:

housing means;

fluid supply means;

a first bore in said housing means, said first bore having a first end portion provided with a first opening and a second end portion opposite said first end portion and provided with a second opening, said second opening being adapted for interconnection with injection means;

a second bore in said housing means, said second bore being larger in diameter than said first bore, said second bore having a first end portion and a second end portion opposite said first end portion and further having a portion intermediate said first and second end portions of said second bore crossing said first bore at a predetermined location between the first and second end portions thereof;

a first port in said second bore proximate said predetermined location and in fluid communication with said first end portion of said first bore;

a second port in said second bore proximate said predetermined location and in fluid communication with said second end portion of said first bore;

piston valve means reciprocably and sealably disposed in said second bore such as to be reciprocable across said first bore to selectively open and close said first and second ports, said piston valve means sealingly dividing said second bore into a first chamber adjacent to said first end portion thereof and a second chamber adjacent to said second end portion thereof, said piston valve means further selectively sealing said first and second ports;

first passageway means through said piston valve means, said first passageway means being open to said first chamber selectively simultaneously registrable with said first and second ports to permit fluid flow between all of said first end portion of said first bore, said second end portion of said first bore and said first chamber of said second bore, in a first predetermined position of said piston valve means;

second passageway means through said piston valve means, said second passageway means being selectively registrable with said first and second ports to permit fluid flow therebetween without permitting fluid flow between said first chamber and said first bore, in a second predetermined position of said piston valve means;

third passageway means through said housing means interconnecting said fluid supply means with said first chamber of said second bore;

first selectively operable pressurizing means interconnected with said first end portion of said first bore to pressurize said fluid therein;

biasing means interposed said housing means and said piston valve means, said biasing means biasing said piston valve means into said first predetermined position; and

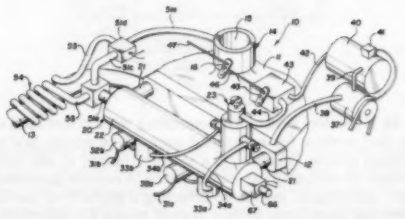
second selectively operable pressurizing means interconnected with said second chamber of said second bore to pressurize said fluid in said second chamber so as to generate a pressure differential between said first and second chambers and to thereby selectively overcome said biasing means and move said piston valve means into said second predetermined position said second selectively operable pressurizing means being operable independently of said first selectively operable pressurizing means such that, when said piston valve means is in said first predetermined position, said first selectively operable pressurization means is in fluid communication with said fluid supply and, thus, provides only minimal pressurization whereas when said piston valve means is in said second predetermined position, said first selectively operable pressurizing means pressurizes said fluid in said first bore.

4,445,485

ENGINE FUEL SYSTEM

Addison B. Chamness, Jr., 2231 W. Lovers La., Dallas, Tex. 75235

Filed Nov. 27, 1981, Ser. No. 325,367
Int. Cl.³ F02M *31/08*
U.S. Cl. 123—546 **21 Claims**



1. In an internal combustion engine having an intake manifold, an inlet air throat for said intake manifold, an air flow control in said inlet throat, and an exhaust manifold; a fuel system comprising:

a heat exchanger including a vaporizing flow path for a fuel mixture and a separate flow path for exhaust gases flowing from said exhaust manifold; means connecting the outlet of said vaporizing flow path to said inlet air throat;

a blending device, for mixing fuel and a substantially inert gas, connected to the inlet of said vaporizing flow path;

means for supplying a pressurized substantially inert gas to said blending device; and means for supplying one or more liquid fuel components to said blending device;

means for controlling the supply of said one or more fuel components to said blending device in relation to the flow of air in said inlet throat;

said substantially inert gas effecting the flow of the mixture

of said gas and fuel components through said vaporizing chamber to said inlet throat.

18. A method for controlling an internal combustion engine comprising the steps

varying the air flow rate in an in air inlet throat in response to the engine power demand;

mixing one or more liquid fuel components with a pressurized substantially inert gas;

varying the flow of fuel components into said mixing chamber in direct relation to the flow of air in said inlet throat;

conveying the mixture of said substantially inert gas and fuel components to said inlet throat by means of said substantially inert gas;

heating said mixture of substantially inert gas and fuel components in a heat exchanger to vaporize said mixture, prior to the conveying of said mixture to said inlet throat.

4,445,486

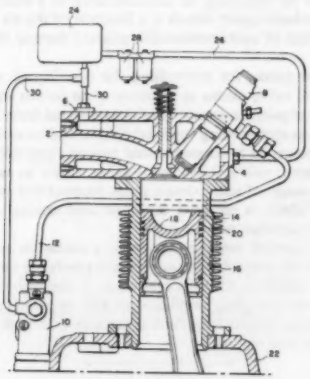
INTERNAL COMBUSTION ENGINE

Nidadavolu N. N. Rao, Pune, India, assignor to Kirloskar Oil Engines Limited, Khadki, Pune, India

Continuation of Ser. No. 392,653, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 40,431, May 18, 1979, abandoned. This application Sep. 28, 1983, Ser. No. 536,823

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **2 Claims**



1. An improved internal combustion engine, comprising a fuel System, a cylinder, said cylinder including a cylinder liner portion and a cylinder head, said cylinder head including cooling passage therein, said cylinder head being cooled by a single fluid, a piston movable within said cylinder, the outer portion of said cylinder comprising an upper, a middle and a lower portion, cooling fins positioned on the middle portion only, the clearance between the piston and the cylinder liner being an amount which allows adequate cooling of the cylinder liner, engine lubricating oil, and piston solely by natural convection, said clearance being uniform around the confronting circumference of said piston and cylinder, said fuel system comprising a fuel source, a fuel injection pump, an injection nozzle mounted in the cylinder head, a first fuel line means extending between the pump and the fuel injection nozzle, and a second fuel line means providing fluid communication among the fuel source, said cooling passages, and said fuel injection pump for said fuel prior to its being supplied to said first fuel line means, whereby the fuel acts as a coolant to cool the cylinder head.

4,445,487

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

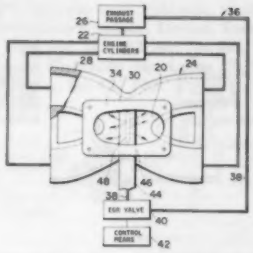
Katunori Higashi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 9, 1982, Ser. No. 367,222

Claims priority, application Japan, Apr. 11, 1981, 56-54727

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **17 Claims**



1. In an internal combustion engine having a intake passage for passing therethrough intake flow of air or an air-fuel mixture toward engine cylinders and an exhaust passage for passing therethrough exhaust gases discharged from the engine cylinders, said intake passage having therein a throttle valve for controlling the intake flow passing therethrough, an exhaust gas recirculation system comprising:

a communicating passage means extending into the intake passage and providing communication between the exhaust passage and the intake passage downstream of the throttle valve for conducting a portion of the exhaust gases from the exhaust passage into the intake passage downstream of the throttle valve, said communicating passage means having a first section outside of the intake passage and a second section within the intake passage;

an elongated substantially straight member provided in the intake passage downstream of the throttle valve and having therein said second section which is substantially straight and extends in the longitudinal direction of said elongated member, said elongated member having a continuous and unobstructed outlet for the exhaust gases at its side downstream of the intake flow through the throttle valve, said outlet communicating said second section with the intake passage at a side of said elongated member downstream of the intake flow through the throttle valve for introducing the exhaust gases into the intake passage in a direction substantially along the direction of the intake flow through the throttle valve; and

said elongated member arranged such that the exhaust gases are prevented from flowing upstream toward the throttle valve.

4,445,488

EXHAUST GAS RECIRCULATION CONTROL FOR DIESEL ENGINE

Takeshi Tanaka; Hisasi Kawai, both of Toyohashi; Toshihiko Igashira, Toyokawa; Kiyonori Sekiguchi, Aichi; Mitsumasa Yamada, Mishima; Michio Kawagoe, Susono, and Masaaki Tanaka, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 19, 1982, Ser. No. 435,301

Claims priority, application Japan, Oct. 20, 1981, 56-166424

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **8 Claims**

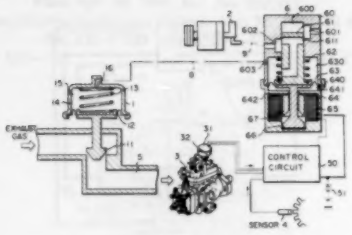
1. An apparatus for controlling exhaust gas recirculation in a diesel engine comprising:

sensors for detecting the operating condition of the diesel engine;

a control circuit for receiving the signal from said sensors and for generating the control signal to control the amount of EGR;

a pump for generating control pressure;

a pressure control valve for controlling the control pressure from said pump to a predetermined value, having a sleeve, a spool valve provided in said sleeve to slide along, a



diaphragm for driving said spool valve in response to said control pressure, and an electromagnetic means for supplying the electromagnetic force to said spool valve, and said predetermined value being changed by the signal supplied to said electromagnetic means; and

an EGR valve for adjusting the amount of EGR, having a diaphragm chamber for receiving the control pressure from said pressure control valve, and changing the opening degree thereof in response to the control pressure.

4,445,489

AIR-FUEL MIXTURE CONTROL FOR AUTOMOBILE ENGINE HAVING FUEL INJECTION SYSTEM

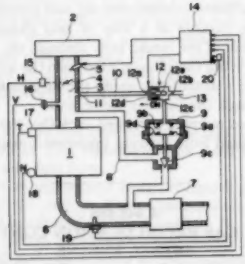
Kazuo Kobayashi; Hideki Tanaka; Katsuyoshi Iida, and Junji Kamite, all of Aki, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 19, 1981, Ser. No. 294,352

Claims priority, application Japan, Aug. 25, 1980, 55-117225; Aug. 25, 1980, 55-117226; Aug. 27, 1980, 55-118894; Sep. 4, 1980, 55-123116

Int. Cl.³ F02D *37/00*

U.S. Cl. 123—571 **5 Claims**



1. An air-fuel ratio control system for an internal combustion engine of a type having a fuel injection system, said control system comprising, in combination:

a fuel intake passage means for the introduction of air into said engine;

a throttle valve disposed in said fuel intake passage means for regulating the flow of air flowing therethrough towards said engine;

a fuel injection nozzle disposed in said fuel intake passage means for injecting a mist of fuel thereinto for the preparation of a combustible mixture with said air flowing therethrough;

an exhaust passage means for the discharge of exhaust gases from said engine towards the atmosphere;

an EGR passage means communicating between said exhaust passage means and said intake passage means for recirculating a portion of said exhaust gases from said exhaust passage means into said intake passage means;

an EGR control valve means disposed in said EGR passage means for controlling the rate of recirculation of that portion of said exhaust gases which flow through said EGR passage means;

a detecting means for detecting the rate of flow of air through said intake passage means in dependence on at least two of signals which are respectively indicative of engine speed, an opening of said throttle valve and a negative pressure developed inside said intake passage means at a position downstream of said throttle valve with respect to the direction of flow of said mixture towards said engine;

a setting means operable during said recirculation of that portion of said exhaust gases and in response to an output signal from said detecting means for setting the rate of flow of fuel to be injected to a value which is required to lean said combustible mixture to such an extent as to be compensated for by the rate of flow of said exhaust gases recirculated into said engine in dependence on said detected rate of flow of said air;

a first means for controlling the rate of flow of fuel to be injected in response to an output from said setting means;

a composition sensor disposed in said exhaust gas passage means for detecting the concentration of a component of said exhaust gases which is a function of the air-fuel mixing ratio of said combustible mixture burned in said engine;

a second means for controlling the opening of said EGR control valve means in response to an output signal from said composition sensor, said output signal from said composition sensor being supplied only to said second controlling means so as to enable said second controlling means to control said EGR control valve means so as to allow the passage of said exhaust gases recirculated at a rate of flow which is required to adjust said mixing ratio to a required value; and

an EGR control means and a memory means for controlling said EGR control valve means in dependence on a control value which is stored in said memory means by detecting a transit operating condition of said engine, said transit operating condition including acceleration and deceleration of said engine.

4,445,490

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Howard E. Van Sicien, Jr., Unadilla, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 20, 1982, Ser. No. 341,031

Int. Cl.³ F02P *5/00*

U.S. Cl. 123—602 **6 Claims**

1. In combination with a internal combustion engine ignition system having at least one spark plug; means for receiving and storing electrical energy including a first solid state electronic switching device for releasing the stored energy when switched; a triggering circuit for switching the first electronic switching device to release the stored energy through said spark plug, said triggering circuit including a second solid state electronic switching device, pulse generating means for generating a succession of electrical trigger pulses in timed relation to the speed of the engine crankshaft for switching the second switching device which switches the first switching device, and means for biasing the second switching device; and means for automatically controlling the bias means, said control means including a transistor connected in parallel with said

biasing means and means for operating said transistor in the active region of its operating characteristics wherein its resistance is not substantially a constant value of resistance, the improvement wherein said transistor operating means comprises:

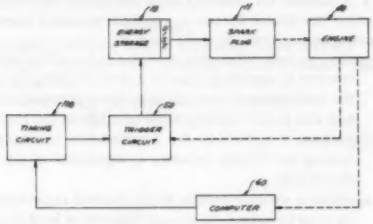
a resistor and diode network adapted to receive electrical current and provide an output current to the transistor, said network comprising:

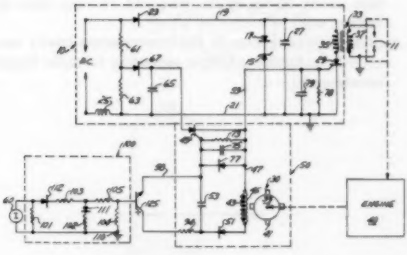
a first resistor having one lead electrically connected to ground and the other lead adapted to receive the electrical current;

a second resistor electrically connected in series with a first diode and having one lead thereof electrically connected to ground;

a third resistor and second diode electrically connected together in series and electrically connected between the other leads of the first resistor and the second resistor and first diode;

a fourth resistor having one lead electrically connected to ground and its other lead electrically connected to the base of the transistor; and





a fifth resistor connected between the other leads of said first diode and second resistor and said fourth resistor.

6. A circuit for controlling the output current to an ignition system from a computer analyzing at least one operating parameter of an internal combustion engine, said circuit comprising:

a transistor having its output electrically connected to said ignition system; and

a resistor and diode network adapted to receive the electrical current from said computer and provide an output current to the base of said transistor, said network comprising:

a first resistor having one lead electrically connected to ground and the other lead adapted to receive the electrical current;

a second resistor electrically connected in series with a first diode and having one lead thereof electrically connected to ground;

a third resistor and second diode electrically connected together in series and electrically connected between the other leads of the first resistor and the second resistor and first diode;

a fourth resistor having one lead electrically connected to ground and its other lead electrically connected to the base of the transistor; and

a fifth resistor connected between the other leads of said first diode and second resistor and said fourth resistor.

4,445,491

IGNITION SYSTEM FOR STARTING A DIESEL ENGINE

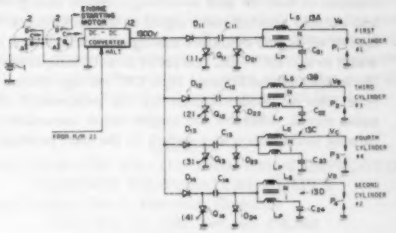
Yasuki Ishikawa; Hiroshi Endo, both of Yokosuka; Masazumi Sone, Tokyo, and Iwao Imai, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

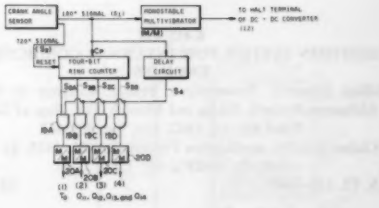
Filed Aug. 16, 1982, Ser. No. 408,701

Claims priority, application Japan, Aug. 27, 1981, 56-134592

Int. Cl.³ F02P 5/00

U.S. Cl. 123—605 **4 Claims**





1. An ignition system for auxiliarily starting a multi-cylinder diesel engine having a low DC voltage supply unit which includes a DC battery and ignition key switch connected to said DC battery, comprising:

(a) a plurality of plasma spark plugs, each installed within a corresponding combustion chamber so as to expose a discharge gap thereof to a spray of injected fuel from a corresponding injection valve;

(b) a DC—DC converter which boosts a low DC voltage from said low DC voltage unit into a high DC voltage when said ignition key switch is placed at a start position for actuating an engine starting motor and placed at an ignition position for continuously supplying the low DC voltage from said DC battery thereinto;

(c) a plurality of energy charging sections each having a first diode connected to said DC—DC converter, a first capacitor a first end thereof being connected to said first diode, and a second diode being connected between a second end of said first capacitor and ground and each of which charges the high DC voltage into said first capacitor;

(d) a plurality of switching elements, each connected between said first capacitor and ground which operatively turns on to ground the first end of said first capacitor so as to discharge the energy charged within said first capacitor therethrough;

(e) a plurality of voltage boosting sections, each connected

between said corresponding energy charging section and spark plug and having a transformer and second capacitor, one end of a primary winding of said transformer being connected to the second end of said first capacitor together with a first end of a secondary winding thereof, a second end of said primary winding being grounded via said second capacitor so as to generate a damping oscillation when said corresponding switching element turns on to apply the charged high DC voltage thereacross, and the second end of said secondary winding being connected to the corresponding spark plug thereof so as to supply a discharge energy into the corresponding spark plug; and

(f) an ignition signal generator which detects a fuel injection timing of each engine cylinder, generates and outputs an ignition pulse signal having a predetermined time of delay with respect to the fuel injection timing of the corresponding engine cylinder into said corresponding switching element to turn on said switching element and generates and outputs another pulse signal at the fuel injection timings of all engine cylinders having a predetermined pulsewidth to said DC—DC converter so as to temporarily halt the output of the boosted high DC voltage during each time interval predetermined by the pulsewidth of said pulse signal, whereby the engine starts immediately by turning said ignition key switch to the start position.

4,445,492

IGNITION SYSTEM FOR INTERNAL-COMBUSTION ENGINES

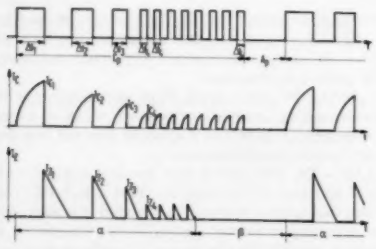
Phillipe Rouanes, Parempuyre, France, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,467

Claims priority, application France, Jul. 22, 1981, 81 14259

Int. Cl.³ F02P *3/02, 3/04, 1/00*

U.S. Cl. 123—606 **10 Claims**



1. Ignition system for internal combustion engines, comprising a transformer having a primary side with a primary winding and a secondary side with at least one secondary winding, a chopper connected to said primary winding for addressing said primary winding, a d-c or rectified a-c voltage source connected to said chopper, said at least one secondary winding being selectively coupled to spark plugs of the internal combustion engine, and electronic control means connected to said chopper for driving said chopper with pulse sequences having individual width-modulated pulses and for supplying the spark plugs with ignition pulse sequences having corresponding individual ignition pulses with modulated energy.

4,445,493

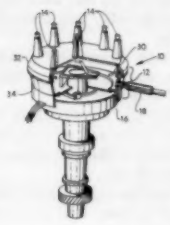
DISTRIBUTOR WITH REDUCED RADIO FREQUENCY INTERFERENCE

Onorio J. Coletti, Roseville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1981, Ser. No. 327,008

Int. Cl.³ H01H *19/00;* **F02P** *1/00*

U.S. Cl. 123—633 **1 Claim**



1. A method for reducing radio frequency interference in an ignition distributor for use in a vehicle mounted internal combustion engine, including the steps of:

sealing an internal communtation cavity of the ignition distributor by applying a seal to a shaft coupling the engine to the distributor to provide a positive commutation cavity seal and to prevent ingestion of oil from the engine when vacuum is applied to the commutation cavity, and positioning an O-ring between components of the ignition distributor;

applying a vacuum source to the internal commutation cavity so as to reduce the pressure therein at least to a vacuum magnitude of 20 inches of mercury and reduce emissions of radio frequency interference during operation of the ignition distributor by connecting the internal commutation cavity to an intake manifold vacuum port of the engine; and

applying silicon grease to the commutation cavity so as to provide a further additive reduction of radio frequency interference.

4,445,494

APPARATUS FOR SUPPORTING CRYSTALLINE WAFERS

Bernd Schiele, Burghausen, and Johann Niedermeier, Burgkirchen, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 304,941

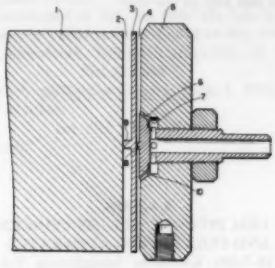
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036829

Int. Cl.³ B28D *7/04*

U.S. Cl. 125—35 **8 Claims**

1. A holding tool which comprises a holding plate having a surface which faces an article being held, an annular nozzle, in the holding plate, formed by a conical hole and a conical guide cone, having a base, mounted in the conical hole with the base of the conical guide cone facing the article being held, a point-

like projection, protroding from the center of the base of the conical guide cone, for contacting the article being held and



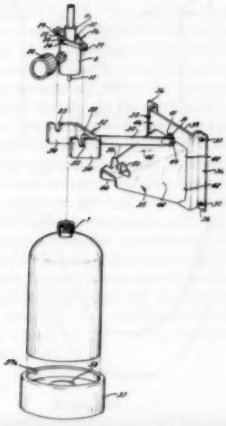
means for providing a controlled flow of gas from the annular nozzle.

4,445,495

PORTABLE STOVE WITH GIMBAL MOUNTING

John W. Frost, DePere, Wis., assignor to Jax Products Inc., DePere, Wis.

Filed Dec. 22, 1982, Ser. No. 439,055
Int. Cl.[3] F24C *15/30*
U.S. Cl. 126—24 6 Claims



1. Gimbal mounting means for a portable stove of the type that comprises a pressurized fuel container having an outlet nipple at an upper end thereof, a burner spaced above said nipple and coaxially connected therewith, and means for supporting a cooking vessel over said burner to be heated by a flame thereat, said gimbal mounting means providing for detachable connection of said stove to a structural member such as a boat bulkhead and enabling the stove to remain upright notwithstanding substantial tilting of the structural member, said mounting means being characterized by:

A. a shaft having a head on a rear end thereof;

B. a plate-like member securable to a structural member and having front and rear surfaces, and further having

(1) a hole through which said head can pass for engagement against said rear surface and through which the shaft can project forwardly with its rear end confined against upward and sideward movement by edge portions that said hole defines, and

(2) a plurality of vertically elongated hook receiving apertures;

C. a bracket cooperable with said plate-like member to support the shaft in rotatable forwardly projecting relation to said plate-like member, said bracket having

(1) a top surface upon which the shaft rests,

(2) a pair of opposing abutments projecting above said top surface and between which the shaft is closely receivable, and

(3) a plurality of rearwardly and downwardly projecting hooks that are receivable in said apertures and engageable with said plate-like member to detachably connect the bracket thereto;

D. a pivot member having an aperture that provides for its coaxial securement to said nipple and having a pair of trunnions which are spaced to opposite sides of said aperture and are coaxial with one another; and

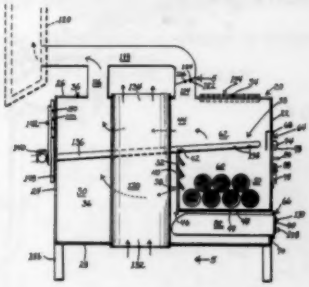
E. a substantially U-shaped yoke on the front end of the shaft having forwardly projecting legs which are spaced laterally in opposite directions from the shaft axis and in each of which there is an upwardly opening transversely extending groove wherein one of said trunnions is receivable for supporting the stove to swing about the mutually perpendicular axes of said trunnions and of the shaft.

4,445,496

WOOD BURNING HEATER PROVIDING IMPROVED UNIFORM TEMPERATURE OUTPUT

George F. Crain, Rte. 2, Elmwood, Ill. 61529

Filed May 10, 1982, Ser. No. 376,668
Int. Cl.[3] F24C *1/14*
U.S. Cl. 126—61 6 Claims



1. A solid fuel burning heater comprising:

a housing having front, back, top, bottom, and side walls;

a louvered internal upstanding divider wall intermediate the front and back walls dividing the housing into front and back sections having combustion and heating chambers respectively therein, the louvered wall terminating a substantial distance below the top wall to provide internal overhead crossover space for combusted gases;

the front wall having draft control means including separately controllable primary and secondary air inlets to the combustion chamber;

a fuel-supporting grate between the front and louvered walls in the lower portion of the front section;

the combustion chamber comprising a primary combustion zone above the grate substantially co-extensive with the louvered wall, and a secondary combustion zone above the primary combustion zone and in communication with the crossover space above the louvered wall;

a vertical heat transfer duct in the heating chamber extending through the top and bottom walls of the housing and having open ends in free communication with external ambient air;

front and rear flues connected with upper portions of the combustion and heating chambers respectively;

a main flue interconnecting the front and rear flues and adapted to provide an outlet connection to a chimney;

damper means for the front flue adjustable to control flow of combusted gases therethrough and effective when opened to direct combusted gases to the main flue and bypass the heating chamber and rear flue;

a draft tube extending from a position externally of the housing into the combustion chamber between the primary and secondary combustion zones, the draft tube having air exit means in the combustion chamber; and

control valve means in the draft tube enabling regulation of secondary air to the combustion chamber;

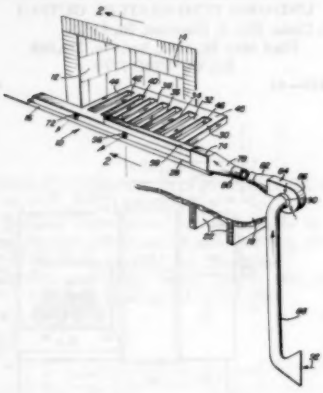
whereby a fire in the combustion chamber can be banked for long term, limited heat output by closing the secondary air inlet at the front wall and adjusting the control valve means to limit the inflow of secondary air through the draft tube to match the inflow of primary air through the primary air inlet.

4,445,497

FIREPLACE HEATING UNIT

Glen W. Kilday, Sr., 448 Sunset Dr., SW., Winston-Salem, N.C. 27103

Filed Oct. 22, 1981, Ser. No. 313,979
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **6 Claims**



1. A fireplace heating unit comprising:

a first set of hollow tubing structures forming a first essentially zigzag heat exchange path with at least three path reversals horizontally disposed in a fireplace and having an air entry area and an air exit area,

a further set of hollow tubing structures forming a second essentially zigzag heat exchange path with at least three path reversals horizontally disposed in a fireplace heating means in side-by-side relation to the first set of tubing structures and having an air entry area and an air exit area with the heat exchange paths being isolated from each other,

air blower means for each set of the hollow tubing structures and coupled to each of the air entry areas thereof,

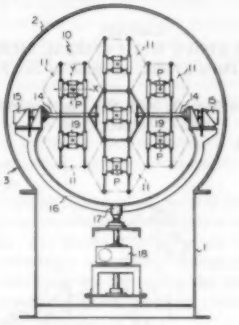
said tubing structures extending from front to rear of the fireplace and supported from the hearth of the fireplace with the tubing structures being in surface contact with the hearth to form a grate to support wood logs or the like having spaces for draft air between adjacent tubing structures, said air exit areas being located at the front of the tubing structures with the air exit areas communicating with a space to be heated, the tubing structures being disposed in coplanar relation and each structure having a separate supply tube for supplying air to the air entry area thereof from the blower means, the supply tubes extending from a common adaptor attached to the blower means adjacent one side of the unit.

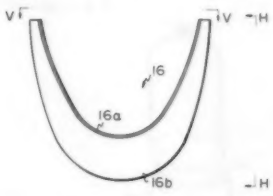
4,445,498

SUPPORT ARM FOR A SUNLIGHT CONCENTRATING AND COLLECTING APPARATUS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Aug. 27, 1982, Ser. No. 412,206
Claims priority, application Japan, Aug. 31, 1981, 56-136293
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **8 Claims**





1. A support arm for a sunlight concentrating and collecting apparatus, said apparatus enclosing a plurality of lenses integrally connected with each other, light conductor cables having light receiving ends thereof arranged at each focal point of said lenses, a first rotatable shaft for turning said integrated lenses around the horizontal axis, a support arm for rotatably supporting the ends of said first rotatable shaft, and a second rotatable shaft for turning said support arm around the vertical axis perpendicular to said horizontal axis, whereby the turning of said first and second shafts is controlled to cause said lenses to face the position of the sun so as to collect sunlight into said light conductor cables, characterized in that said support arm comprises a first member having a curved plate formed substantially in the shape of circular arc, a second member having an inverted saddle-shaped plate or plates, said second member being firmly fixed along the outer surface of said first member, and lies on at least one plane containing the axis of first rotatable shaft and is symmetrical with respect to the neutral plane of said first member.

4,445,499

GROUND-STORAGE OF HEAT SUCH AS SOLAR HEAT

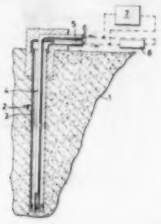
Ove B. Platell, Sigtuna, Sweden, assignor to Sunstore Kommanditbolag, Malmo, Sweden

Continuation-in-part of Ser. No. 866,719, Jan. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 841,818, Oct. 13, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,518

Claims priority, application Sweden, Nov. 1, 1976, 7612143; Sep. 26, 1977, 7710748

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—430 **8 Claims**



6. A method of establishing a heat-storage zone in the earth which can be supplied with heat from heat-absorbing means during one season of the year and from which heat can be taken in another season of the year for distribution to heat-emitting means in a building or similar structure with the heat storage zone having sufficient capacity to store all of the heat necessary for the building during said another season without raising the temperature at the periphery of the storage zone in the earth above about 35° C. with the variation of the temperature at the periphery of the storage zone not to exceed 10° C. during the year, said method including the steps of:

forming a plurality of channels in the earth with the channels spaced a distance s from the periphery of the storage zone and a distance not exceeding 2s from one another,

said distance s being approximately one (1) meter in the case of earth rich in water to approximately three (3) meters in earth which is relatively dry and rock such as granite,

providing a liquid conduit between said heat-absorbing devices, said heat-emitting devices and said channels, and

circulating said liquid between said heat-absorbing devices and said channels during one season of the year to store heat in said heat storage zone and circulating said fluid between said channels and said heat-emitting devices during another season of the year to remove heat from said heat storage zone.

4,445,500

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 275,117, Jun. 18, 1981, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, said Ser. No. 275,117, and Ser. No. 275,116, each is a division of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,850

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] **A61K** *31/00*; **A61M** *5/14*

U.S. Cl. 128—1 R **6 Claims**

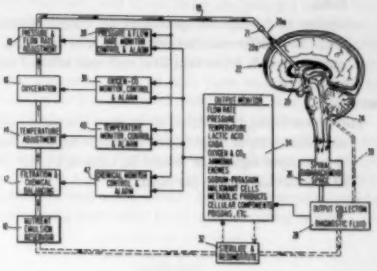
1. A method of treating hypoxic-ischemic central nervous system tissue comprising:

(a) providing a physiologically acceptable oxygenated fluorocarbon emulsion as treatment fluid;

(b) establishing a circulation of said fluid through an oxygenator at a first preselected flow rate to oxygenate said fluid;

(c) injecting said oxygenated fluid into the cerebrospinal pathway at a first injecting point and at a second preselected rate;

(d) substantially continuously withdrawing fluid from said



cerebrospinal fluid pathway at a second point which is selected to create a circulation of said oxygented fluid in the vicinity of said hypoxic-ischemic tissue sufficient to support significant aerobic respiration of a portion of said tissue,

whereby said portion of said tissue will be metabolically sustained during said treatment.

4,445,501

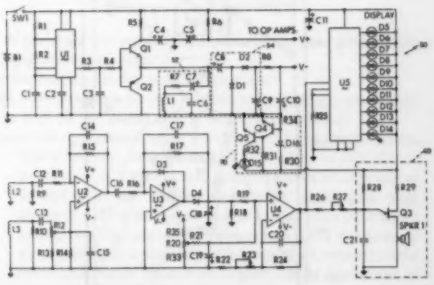
CIRCUITS FOR DETERMINING VERY ACCURATELY THE POSITION OF A DEVICE INSIDE BIOLOGICAL TISSUE

Robert G. Bresler, Watertown, Mass., assignor to McCormick Laboratories, Inc., Belmont, Mass.

Filed May 7, 1981, Ser. No. 261,521

Int. Cl.[3] **A61B** *6/12*

U.S. Cl. 128—1.5 **8 Claims**



1. A circuit for determining very accurately the position of a device in biological tissue, comprising:

a detector circuit,

said detector circuit having a field coil which, when activated, generates a field, said detector circuit also having a first receiving coil and a second receiving coil which are both disposed in the field generated by said field coil,

whereby said first receiving coil produces a first output signal and said second receiving coil produces a second output signal when the field is generated,

a variable resistor having a wiper, a differential amplifier having first and second inputs and an output,

a first side of said first receiving coil and a first side of said second receiving coil being connected to a common reference, a second side of said first receiving coil being

connected to said first input of said amplifier, a second side of said second receiving coil being connected to said variable resistor, said wiper of said resistor being connected to said second input of said amplifier so that the magnitude of said second output signal may be varied so as to make it equal to the magnitude of said first output signal when no device is detected in the field,

whereby said amplifier provides an output signal when there is a difference between said first and said second output signals from said first and said second receiving coils, and

an alarm,

said alarm being connected to receive the signal from said amplifier output to produce an alarm signal when there is an output signal, as would be caused by the presence of the device inside the field.

4,445,502

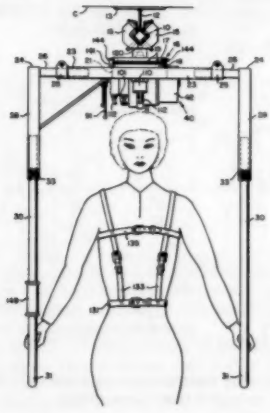
SAFETY RESTRAINT SYSTEM AND INERTIAL REEL THEREFOR

Algernon G. Swan, 2533 Woodlake Dr., Albilene, Tex. 79606; Eugene A. Stead, Jr., Rte. 1, Box 135, Clarksville, Va. 23927; William P. Thompson, 6315 Scatterfield Rd., Anderson, Ind. 46015, and David P. Colvin, Rte. 5, Box 67, Apex, N.C. 27502

Continuation-in-part of Ser. No. 216,559, Dec. 15, 1980, abandoned, which is a division of Ser. No. 92,568, Nov. 8, 1979, Pat. No. 4,256,098. This application Apr. 21, 1982, Ser. No. 370,468

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—25 R **11 Claims**



1. In a safety restraint system having an overhead rail, an inertial reel mounted on said rail, and a retractable, patient-supporting cord wound at one end on a rotatable spool in said reel and disposed to be connected at its opposite end to an ambulatory patient, the improvement comprising

means connecting said inertial reel to said rail for movement longitudinally thereof, and for rotational adjustment relative thereto about a vertical axis, and

means for releasably securing said reel against rotation relative to said rail, and selectively in one of at least two different operating positions angularly spaced approximately 180° from each other about said vertical axis.

4,445,503

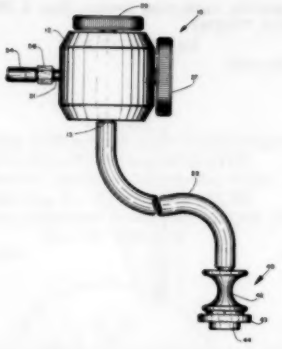
PERCUSSOR ASSEMBLY

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation-in-part of Ser. No. 50,685, Jun. 21, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,355

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—40 **3 Claims**



1. A percussor assembly comprising:

a rigid body member having a gas inlet passageway and a single gas outlet passageway,

a stationary valve seat and a single moveable diaphragm and biasing means cooperating therewith for urging said diaphragm against said valve seat to provide a gas tight seal between said passageways,

a gas pressure chamber between said gas inlet passageway and said valve seat,

a single remote applicator pneumatically connected to said gas outlet passageway with a flexible gas supply tubing for receiving bursts of gas therefrom, said applicator having a percussion chamber and an expandable diaphragm exposed thereto, and

means for delivering pressurized gas to said gas pressure chamber sufficient to overcome the biasing force of said biasing means whereby said gas tight seal is temporarily broken and a burst of gas passes from said gas pressure chamber through said gas outlet passageway to said percussion chamber causing expansion of said diaphragm.

4,445,504

CHIROPRACTIC ADJUSTMENT TABLE

Fred H. Barge, 322 Cameron Ave., LaCrosse, Wis. 54601

Filed Dec. 2, 1981, Ser. No. 326,744

Int. Cl.³ A61H *5/00*

U.S. Cl. 128—70 **20 Claims**

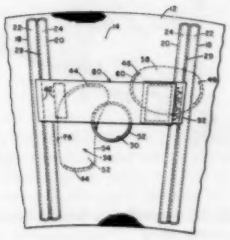
1. A chiropractic examination table apparatus comprising a support table including a separate vertically adjustable cushion generally registered horizontally herewith actuating means to abruptly, suddenly and rapidly raise the cushion means a controlled vertical distance.

4,445,505

KNEE BRACE FOR PREVENTING LATERAL DISPLACEMENT OF THE PATELLA

Donald Labour, 82 Wellsmere Rd., Roslindale, Mass. 02167; James R. Cannon, 22 Karen Dr., Randolph, Mass. 02368, and Alfred Klugman, 187 Woodward St., Newton, Mass. 02168

Filed Dec. 28, 1981, Ser. No. 335,197
Int. Cl.[3] A61F *3/00*
U.S. Cl. 128—80 C 17 Claims



1. A knee brace for preventing patella displacement comprising:

a tubular sleeve made of an elastic webbing material, said sleeve being designed to fit over the leg and extend from below the knee upwardly to the thigh,

a relatively firm elongated first pad attached to the sleeve, said pad being positioned on the sleeve to lie just laterally of the patella when the sleeve is worn on the leg overlying the knee so as to prevent lateral displacement of the patella when the sleeve is in place,

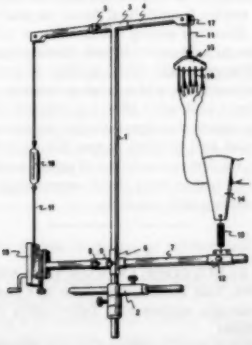
and a second pad attached to the sleeve and positioned to engage the medial femoral epicondyl and condyl notch when the sleeve is in place and prevent the sleeve from turning on the leg and displace the first pad from the patella.

4,445,506

BONE ALIGNING APPARATUS

Kjell Johansson, and Hermino Duarte-Martins, Jr., both of Sundsvall, Sweden, assignors to Landstingens Inkopscentral, LIC, Solna, Sweden

Filed May 13, 1982, Ser. No. 377,954
Claims priority, application Sweden, May 13, 1981, 8103017
Int. Cl.[3] A61F *5/04*
U.S. Cl. 128—84 R 6 Claims



1. Bone aligning apparatus comprising,

a vertically oriented member having a lower end including means for attaching said member to a desired supporting structure and an upper end including a first cross piece;

an upper beam slidingly attached to said member at said first cross piece and extending longitudinally relative to said member, said upper beam including a first roller at one end and a second roller at the other end;

a second cross piece slidingly attached to said member and spaced from said first cross piece;

a lower beam slidingly attached to said member at said second cross piece and extending longitudinally relative to said member, said lower beam including a crank device at one end and a holder slidingly attached to the other end;

a rope one end of which is operatively attached to said crank device, said rope being supported by said first and second rollers, the other end of said rope extending from said second roller towards said other end of said lower beam;

a limb retaining means attached to said holder; and,

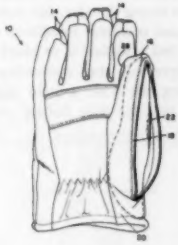
a repositioning disc attached to said other end of said rope and including means adapted to hold the extreme portions of a limb in a physiologically correct position whereby actuation of said crank device causes said rope to pull said repositioning disc away from said retaining means.

4,445,507

GLOVE WITH THUMB RESTRAINT ELEMENT

Joel H. Eisenberg, 53A Blackhawk La., Stratford, Conn. 06497

Filed Dec. 23, 1980, Ser. No. 219,481
Int. Cl.[3] A61F *13/00, 5/04*
U.S. Cl. 128—133 10 Claims



1. A glove for preventing injury to the thumb's ulnar collateral ligament comprising:

a hand covering having a thumb portion,

said thumb portion having a retainer means disposed at least in part on the radial side of said thumb portion,

said retainer means being inflexible in the radial direction, and when the wearer's thumb is in place in said thumb portion of said glove, said retainer means is disposed to extend over the thumb's metacarpal phalangeal joint and is of sufficient length to also extend over substantial portions of the adjacent bones which form the joint so as to generally immobilize the bones with respect to the joint in the radial direction whereby radial movement of the thumb which might injure the ulnar collateral ligament of the thumb is prevented.

4,445,508

NASAL PROTECTIVE METHOD AND DEVICE

Norman M. Lake, 1705 Newport Dr., Lancaster, Pa. 17602

Continuation of Ser. No. 183,214, Sep. 2, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,789
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—201.18 1 Claim

1. A new process of employing an improved nasal splint for helping the human nose maintain its mucous membranes in good condition, said splint comprising a U-shaped wire spring for straddling the nose and having two nubs each of ellipsoidal-like shape of circular outline with two convex side faces, each leg of the U-shaped spring being embedded in the longitudinal

axis of a different one of the nubs and employing the improvement of each leg holding the nubs only by friction to allow the same to be rotatable and slidable on the legs of the spring, and said process comprising locating the splint such that the spring of the splint presses the nubs in on the sides of the nose in an appropriate area defined by the portion above the alae and by the upper portion of the alae, this being done to the extent of closing off the nasal passages by exerting a firm pressure on the septum and wherein the improvement comprising closing off the nasal passages for a period of 30 minutes or more thereby

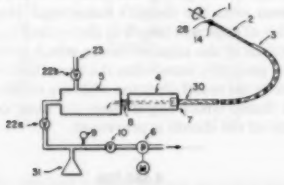
causing the nasal temperature to increase from its normal 91° F. to about 98° F. then relocating said splint such that its spring presses the nubs in on the sides of the nose in the area defined by the portion just above the alae, this being done to a degree sufficient to trap and minimize inhalation of airborne irritants entering the nose but insufficient to block breathing and watery secretions therefrom thus enhancing the nasal filtering system and helping the nose protect against the numerous irritants breathed into the nose during certain seasons of the year.

4,445,509

METHOD AND APPARATUS FOR REMOVAL OF ENCLOSED ABNORMAL DEPOSITS

David C. Auth, 4739 Somerset Ave. Southeast, Bellevue, Wash. 98006

Filed Feb. 4, 1982, Ser. No. 345,656
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **32 Claims**



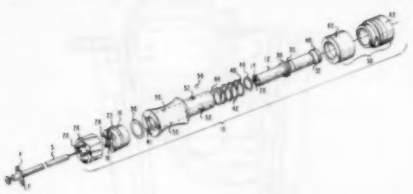
1. A cutting tool for removing abnormal deposits, comprising a cylindrically symmetric body having a center cavity and a nose , at least one cutting flute extending along the outer surface of said body each cutting flute having a circumferentially facing cutting face formed thereon, and a radial fluid port extending from in front of a respective face of a flute into said center cavity, each port having a circumferential component extending into said cavity away from said cutting face whereby rotation of said cutting tool within a blood vessel about the major axis of said body has a tendency to force blood inwardly through said port.

4,445,510

AUTOMATIC INJECTOR FOR HYPODERMIC SYRINGES OR THE LIKE AND LANCET HOLDER FOR USE IN CONJUNCTION WITH AN AUTOMATIC INJECTOR

Ronald F. Rigby, P.O. Box 341 R.D. 6, Latrobe, Pa. 15650

Filed Sep. 13, 1982, Ser. No. 417,607
Int. Cl.³ A61B *17/34*
U.S. Cl. 128—329 R **14 Claims**



1. An apparatus for propelling a needle bearing device into biological tissue comprising:

an inner sleeve forming an open-ended longitudinal chamber therein for removably receiving said needle bearing device, said inner sleeve having first and second spaced apart recesses disposed in the outer surface thereof, said first recess being of a greater depth than said second recess;

an outer sleeve forming an open-ended longitudinal chamber therein for receiving and for permitting the movement therein of said inner sleeve between first and second positions, said outer sleeve having at least one aperture disposed therethrough;

biasing means for biasing said inner sleeve into said first position relative to said outer sleeve;

ball bearing means dimensioned to reside within said at least one aperture and to selectively reside within said second recess when aligned with said aperture when said inner sleeve is in said second position relative to said outer sleeve; and

locking sleeve means forming an open-ended longitudinal chamber therein for receiving and for permitting the movement therein between first and second positions of a portion of said outer sleeve adjacent to said at least one aperture disposed therein, said locking sleeve including an inner wall surface for forcing said ball bearing means into said second recess, when said outer sleeve is in said second position relative to said locking sleeve means, so as to lock the position of said inner sleeve relative to said outer sleeve, when said inner sleeve is in said second position thereof relative to said outer sleeve, longitudinal force on said locking sleeve means in a direction urging the same from said second position relative to said outer sleeve causing said ball bearing means to disengage said raised surface and said inner sleeve to shift position from said second position to said first position relative to said outer sleeve as a result of the action of said biasing means thereon, said first recess being provided to accept said ball bearing means during assembly of said apparatus, said first recess being of sufficient depth to permit the passage of said locking sleeve means over said ball bearing means during said assembly.

4,445,511

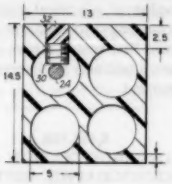
PACER ELECTRODE CONNECTOR ASSEMBLY

David Cowdery, East Ballina, and John R. Cooper, Five Dock, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Jun. 24, 1982, Ser. No. 391,519
Int. Cl.³ A61M *1/36*
U.S. Cl. 128—419 P **37 Claims**

1. A connector assembly for connecting two bipolar electrode lead proximal terminations to four terminals extending through the case of a heart pacer; each of said bipolar electrode

lead proximal terminations having a forward pin and a rearward annular ring; comprising four metallic termination blocks each for electrical connection to a respective one of said terminals; and at least two secured fluid-insulating metal-free plastic parts which make slidable engagement with each other and at



least one of which makes slidable engagement with said four metallic termination blocks and said case; pairs of said metallic termination blocks having aligned bores therein and said at least two secured plastic parts forming respectively aligned bores to accommodate the insertion of two bipolar electrode lead proximal terminations.

4,445,512

METHOD AND APPARATUS FOR EVALUATING PACER BATTERY STATUS AND STIMULATION EFFECTIVENESS

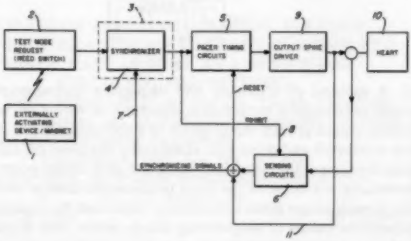
Yaakov Krupka, Rehovot; Salomon Feldman, Givatayim, and Shmuel Yerushalmi, Rehovot, all of Israel, assignors to Omikron Scientific Ltd., Rehovot, Israel

Continuation of Ser. No. 123,045, Feb. 20, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,742

Claims priority, application Israel, Feb. 20, 1979, 56700

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PT **3 Claims**



1. A method for evaluating the battery status and stimulating effectiveness of an inhibited type cardiac pacemaker system which issues periodic stimulating pulses between basic pacemaker intervals, said pacemaker system including magnet test means for performing said evaluating in a number of magnetic test intervals, means for activating said magnet test means, a synchronizer for coordinating the timing and sensing circuits of the pacemaker system, said system being capable of sensing periodic R-waves of a heart, which method comprises the step of:

(a) applying magnetic means to actuate said magnetic test means;

(b) sensing one of a first natural R-wave and the end of a first basic pacemaker interval;

(c) applying a predetermined number of consecutive asynchronous stimulation pulses, said asynchronous pulses being applied after a magnetic test interval which is shorter in duration than the basic pacemaker interval;

(d) sensing one of the next R-waves and end of a basic interval;

(e) applying again a sequence of a predetermined number of consecutive asynchronous stimulating pulses during the magnetic test intervals; and

(f) repeating steps (a) through (e) for the duration of the magnet test, whereby the length of the magnet interval and the heart response to the stimulating pulses being indicative of battery status and stimulation effectiveness, respectively.

4,445,513

DEVICE FOR STRAIGHTENING SPINAL COLUMN

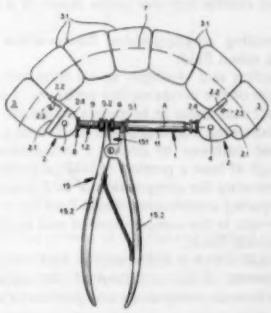
Bernhard Ulrich, Ulm, Fed. Rep. of Germany, and Gys H. Slot, Nijmegen, Netherlands, assignors to Max Bernhard Ulrich, Ulm, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,169

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121271

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—69 **12 Claims**



1. A device for straightening a spinal column having a succession of vertebrae extending along a nonstraight line lying generally in a plane, said device comprising:

an elongated bar lying generally in said plane of said line and having a pair of relatively longitudinally displaceable bar parts in turn having respective bar ends;

a pair of connectors at said ends and each having two generally penpendicular flanges one of which is provided with projecting points and is shaped to fit onto a vertebra end surface with said points engaged therein and the other of which is shaped to fit simultaneously onto a vertebra side surface and is provided with the respective pivot;

means for securing said connectors to respective vertebrae of said succession;

respective pivots between said connectors and the respective ends and defining therebetween respective generally parallel axes transverse to said plane; and

means including a main abutment movable along and fixable on one of said parts and longitudinally engageable with the other of said parts for limiting relative longitudinal displacement of said parts toward each other, whereby said main abutment can be moved along said one part to increase the spacing between said ends and thereby can straighten the succession of vertebrae between said connectors.

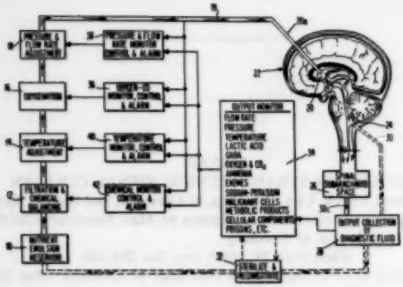
4,445,514
EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797. This application Jun. 18, 1981, Ser. No. 275,117

Int. Cl.³ A61K *31/00*; A61M *5/14*

U.S. Cl. 128—632 **26 Claims**



1. A method of diagnosing the condition of suspected hypoxic-ischemic central nervous sytem tissue of a mammal, comprising:

(a) providing an oxygenated fluorocarbon emulsion synthetic spinal fluid;

(b) injecting said synthetic spinal fluid into at least a first portion of the cerebrospinal pathway of said mammal to contact said tissue to become a diagnostic fluid;

(c) withdrawing said diagnostic fluid from a second portion of said pathway to create a circulation of said fluid through at least a portion of said pathway;

(d) monitoring the composition of said diagnostic fluid; and

(e) comparing constituents of said fluid for at least a selected difference in the compositions of said synthetic spinal and diagnostic fluids;

whereby said selected differences in said compositions are at least diagnostic of the condition of said suspected hypoxic-ischemic tissue disposed along said portion of said cerebrospinal pathway.

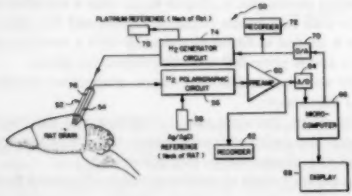
4,445,515
APPARATUS FOR PERFORMING TISSUE PERFUSION MEASUREMENTS

Gene R. DiResta, 2 Hudson View Dr., Yonkers, N.Y. 10701

Filed Nov. 2, 1981, Ser. No. 317,515

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—632 **6 Claims**



1. Apparatus for measuring the perfusion rate of fluid through animal tissue comprising probe means adapted to be contacted with the tissue to be measured for generating a detectible substance, such as hydrogen, in situ in said tissue responsive to an applied electrical current, first sensor means spaced a first distance from such probe means adapted to be contacted with said tissue for sensing the concentration of said substance, control means operatively associated with said sensor means for applying a current to said probe means at a value to maintain the concentration of said substance at said first sensor means at a selected level, and measuring means for determining the value of electrical current required to be applied to said probe means to maintain the concentration of said substance at said first sensor means at said selected level whereby the perfusion rate may be determined as a function of the value of said current.

4,445,516
PROCESS FOR THE DIGITIZATION AND DISPLAY OF THERMOGRAPHIC RECORDS

Hermann Wollnik, Fernwald; Rudiger Haas, Altenkirchen, and Folkert Kassen, Lahnau-Atzbach, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen Wiertemberg, Fed. Rep. of Germany

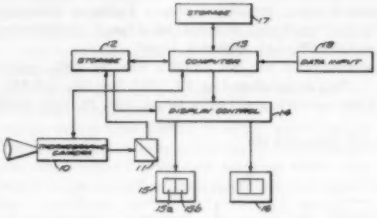
PCT No. PCT/DE81/00076, 371 Date Dec. 18, 1981, 102(e) Date Dec. 18, 1981, PCT Pub. No. WO81/03418, PCT Pub. Date Dec. 10, 1981

PCT Filed May 26, 1981, Ser. No. 336,397

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020352

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—736 **10 Claims**



1. A method of digitizing and displaying thermographic records of biological or technical structures in which the temperature values at each image point of a thermogram are digitized, evaluated and displayed, comprising the steps of: calculating the temperature-gradient value for each image point by determining the slope of the local temperature change on the basis of each image point temperature value and the measured temperature values of neighboring image points; and displaying the local distribution of the temperature-gradient values for a selected image region.

4,445,517
SUCTION DISSECTOR

James R. Feild, 2254 N. Parkway, Memphis, Tenn. 38112

Filed Sep. 28, 1981, Ser. No. 306,563

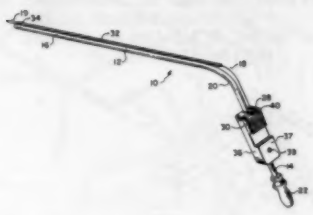
Int. Cl.³ A61B *10/00*

U.S. Cl. 128—752 **12 Claims**

1. In a hand-held surgical device having an elongated housing defining a passageway between open-ended proximal and distal end portions; a suction connecting means disposed at said proximal end portion of the housing for applying suction to the passageway; a rectangular platform disposed at the proximal end portion of said housing and distal to the suction connecting means; said platform having a substantially flat upper surface, a bottom surface, side walls depending downwardly from said upper surface and extending to the bottom surface, and forward and rearward end walls depending downwardly from said top surface through which the passageway extends; and a suction adjusting means disposed in said platform, said adjusting means comprising an opening in the upper surface of said

platform, and a second passageway extending from the opening in the surface of the platform to the passageway of the elongated housing, said opening communicating with the interior of the suction housing such that the reversible occlusion of said opening proportionately adjusts the magnitude of suction within the passageway of the housing; the improvement comprising a means for controlling the bi-directional movement of a surgical instrument longitudinally along the elongated housing, said controlling means comprising:

a recess in the forward upper surface of said platform adapted to receive a portion of the surgical instrument,



said recess having an upper surface substantially parallel to the upper surface of the platform, a forward end adjacent the forward wall of the platform, and a downwardly depending rear wall extending from the upper surface of the platform to the upper surface of the recess; and

a guide member disposed adjacent the forward end of the recess in the platform, said guide member having a passageway for allowing longitudinal movement of the surgical instrument therethrough, and a retaining means for preventing the outward deviation of said instrument from the platform.

4,445,518

METHOD OF APPLYING AN AREAL FLEXIBLE ELECTRODE TO A SPOT OF THE BODY COVERED BY A PLASTIC CAST AS WELL AS A DEVICE FOR EXECUTING THIS METHOD

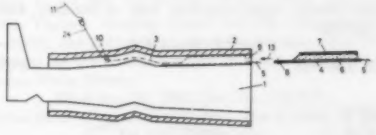
Danièle Eggli, Dübendorf; Dieter von Ow, Zürich,*and Gregor Hüni, Dübendorf, all of Switzerland, assignors to Hans Leuenberger, Wallisellen, Switzerland

Filed May 8, 1981, Ser. No. 262,205

Claims priority, application Switzerland, May 5, 1980

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—783 **10 Claims**



1. The method for applying an areal flexible electrode on a spot of the body covered by a plaster cast comprising:

drawing the electrode in along the inside surface of the plastic case to position said electrode on said body spot; and

elastically supporting said electrode at the respective body spot against the inside surface of the plaster cast.

4. A device for stimulating a spot on the body encased by a plaster cast comprising:

a flexible areal electrode adapted to be deposed between the cast and the body, said electrode having one conductive surface defining an electrode for contacting and stimulating said body spot, another surface to engage the inside of said cast and means between said surfaces acting against the cast to urge the conductive surface against the body spot;

wires connected to said electrode conductive surface to transmit stimulating electric current thereto; and

means for locating said areal electrode within said cast against said body spot.

4,445,519

METHOD AND APPARATUS FOR JOINING COAXIAL ROD-SHAPED ARTICLES

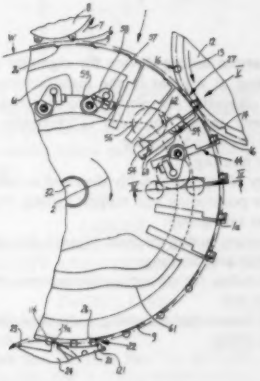
Werner Hinz, Lauenburg, and Gerhard Tolasch, Wentorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,760

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104505

Int. Cl.³ A24C *5/08, 5/10*

U.S. Cl. 131—94 **20 Claims**



1. A method of joining groups of coaxial rod-shaped articles by means of adhesive-coated uniting bands at a rolling station, particularly of joining groups of articles which constitute or form part of smokers' products, comprising the steps of subdividing a web of wrapping material into a series of discrete uniting bands; conveying the uniting bands of said series in a predetermined direction and along a predetermined path toward the rolling station; contacting successive uniting bands in said path by discrete groups of articles at a location which is spaced apart from the rolling station; biasing at least one article of each group against the respective uniting band during transport toward the rolling station; and rolling successive groups about their respective axes at the rolling station so that the respective uniting bands are convoluted around such groups of articles.

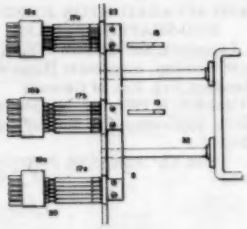
7. Apparatus for joining groups of coaxial rod-shaped articles by means of adhesive-coated uniting bands, particularly for joining groups of articles which constitute or form part of smokers' products, comprising a conveyor arranged to travel in a predetermined direction and having a supporting surface; means for supplying to said conveyor uniting bands and groups of articles so that each band overlies a portion of said surface and the corresponding group overlies the band; a rolling device located downstream of said supplying means, adjacent to the path of movement of groups in said direction and defining with said surface a gap having a width such that successive groups are rotated about their respective axes during travel through said gap with attendant convolution of the associated uniting bands therearound; and means for biasing at least one article of each group against the respective uniting band during transport of groups toward said gap.

4,445,520

CIGARETTE DETECTION AND REJECTION DEVICE

Raymond J. Knight, Richmond; Robert T. Mitten, Mechanicsville, and Robert L. Ripley, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,808
Int. Cl.³ A24C 5/00, 5/60
U.S. Cl. 131—282 8 Claims



1. A cigarette testing device for cigarette packaging machines located at a point in the manufacturing process just before the cigarettes are placed into cigarette packages, for simultaneously testing the ends of cigarettes disposed in a group, said device comprising:

a support housing;

a plurality of tappets slidably disposed in said housing;

means for positioning said tappets against the ends of cigarettes in said group;

biasing means acting on said tappets for positioning said tappets in said housing;

detector means for detecting the position of each of said tappets; and

rejection means for removing individual faulty cigarettes from a group.

4,445,521

COMPOSITION AND PROCESS FOR THE TREATMENT OF KERATIN MATERIALS WITH POLYMERS

Jean-Francois Grollier; Claire Fiquet; Chantal Fourcadier, all of Paris; Claude Dubief, Versailles, and Daniele Cauwet, Crosne, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 886,554, Mar. 14, 1978, Pat. No. 4,240,450. This application Aug. 22, 1980, Ser. No. 180,443
Claims priority, application Luxembourg, Mar. 15, 1977, 76955
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ A45D 7/00; A61K 7/06, 7/08, 7/09
U.S. Cl. 132—7 74 Claims

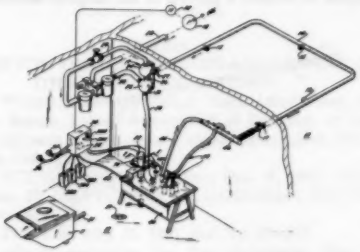
1. Process for the treatment of keratin material which comprises applying thereto a composition comprising an anionic polymer containing at least one of a sulfonic acid, carboxylic acid and phosphoric acid unit and having a molecular weight of from about 500 to 5 million together with at least one cationic polymer in a solvent medium wherein said anionic and said cationic polymers are each present in an amount from about 0.01 to 10% relative to the total weight of the composition, and subsequently rinsing the material.

4,445,522

APPARATUS FOR CLEANING LIQUID CONVEYING SYSTEM AND CONTROL VALVE ASSEMBLY THEREFOR

Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Sep. 23, 1982, Ser. No. 422,360
Int. Cl.³ B08B 9/06
U.S. Cl. 134—58 R 11 Claims



1. Apparatus for cleaning a liquid conveying system comprising:

a tank having a tank drain port;

supply means for periodically supplying fresh cleaning liquid from a source to said tank;

delivery means for delivering cleaning liquid from said tank to said system;

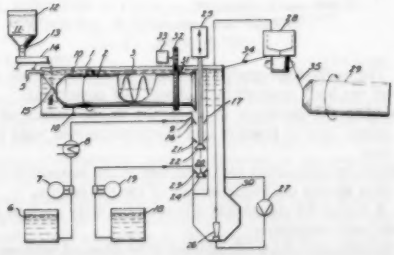
and control valve means on said tank for receiving used cleaning liquid returning from said system and operable for closing said tank drain port and directing used cleaning liquid from said system into said tank whereby the used cleaning liquid is available for recirculation and, alternatively, for opening said tank drain port to empty said tank and directing used cleaning liquid from said system elsewhere than into said tank.

4,445,523

APPARATUS FOR THE SURFACE CLEANING OF QUARTZ-CRYSTAL PIECES

Rolf Brüning, Bruchköbel, and Klaus Reimann, Rodenbach, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau am Main, Fed. Rep. of Germany

Division of Ser. No. 312,470, Oct. 19, 1981. This application Apr. 29, 1983, Ser. No. 489,929
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040385
Int. Cl.³ B08B 3/06
U.S. Cl. 134—65 4 Claims



1. An apparatus for cleaning the surface of small quartz crystal pieces comprising a trough (1) formed at least on its

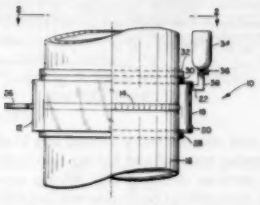
inside of a plastic and having an inlet (9) for introduction of pure aqueous hydrofluoric acid and an overflow (5) for removal of spent hydrofluoric acid, said trough containing therein a rotary-cylinder conveyor (2) made of plastic feeding means disposed in proximity to said overflow (5) for feeding quartz-crystal pieces into said trough (9) and discharge means (17) in proximity to said inlet of said trough (1) and said rotary-cylinder conveyor (2) being sealed relative to each other by means of a seal (10).

4,445,524

AUTONOMOUS CLEANING INSPECTION DEVICE

Thomas M. Angel, Houma, La., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Feb. 24, 1983, Ser. No. 469,285
Int. Cl.³ B08B *3/08*
U.S. Cl. 134—113 **10 Claims**



1. A device for removing marine growth from submerged structures prior to the application of non destructive testing inspection procedures comprising:

A flexible transparent housing, means carried by said housing for engaging a predetermined area of a submerged structure to define with the surface of said area a chamber, said means including clamp means for clamping said housing to at least a portion of said structure and seal means carried by said housing for engagement between the periphery thereof and the adjacent surface of said area;

A reservoir carried by said housing and conduit means extending between the reservoir and the housing for selectively admitting liquid from the reservoir to the interior of the housing whereby a corrosive liquid from the reservoir can be admitted to the chamber to dissolve the marine growth.

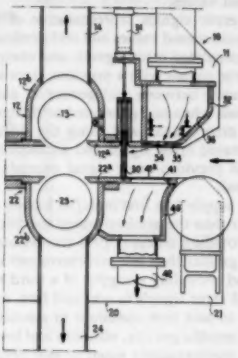
4,445,525

ARRANGEMENT OF THE INPUT AND OUTPUT ENDS OF A COOLING MACHINE FOR METAL SHEETS

Stéphane Viannay, Trappes; Alfred Germain, Dunkerque-Malo-Les-Bains, and Jack Sebbah, Trith-Saint-Leger, all of France, assignors to Union Siderurgique du Nord et de l'Est de la France, Paris, France

Filed Jan. 11, 1982, Ser. No. 338,512
Claims priority, application France, Jan. 9, 1981, 81 00287
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—122 R **8 Claims**

1. A machine for cooling metal sheets or like products, which machine comprises an upper frame and a lower frame, each of said frames comprising two lateral walls and case means interconnecting the two walls and defining an enclosure having an input end and an output end for receiving a cooling liquid circulating therein, said enclosure having means defining a lower surface over which surface said sheet travels through the machine, and the machine further comprising, adjacent said input end and adjacent said output end, a sump for collecting the cooling liquid and carried by the lower frame and having a liquid receiving opening extending throughout the width of said enclosure and located substantially at the level of said surface of said enclosure, liquid projecting means carried by the upper frame and liquid contained in said projecting means, the liquid projecting means having outlet means oriented at 10°–20° to the horizontal from the projecting means downwardly toward said enclosure so as to project a jet of liquid in a downwardly inclined direction toward the interior



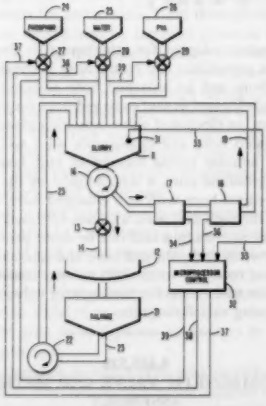
of said enclosure so that said jet is directed in counter-current fashion against the cooling liquid in said enclosure which tends to issue from said enclosure, said sump opening being located substantially vertically below said outlet means of said liquid projecting means.

4,445,526

SYSTEM AND METHOD FOR CONTROLLING THE SPECIFIC GRAVITY AND VISCOSITY OF THE SLURRY APPLIED TO TELEVISION PICTURE TUBE FACEPLATES

John W. Woestman, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,295
Int. Cl.³ G05D *11/06*; G06F *15/46*
U.S. Cl. 137—3 **12 Claims**



10. A method of continuously controlling the specific gravity and viscosity of a slurry to which additional slurry having unknown specific gravity and viscosity is frequently added comprising the steps of:

dispensing said slurry from a first container onto an object to be coated with slurry and returning excess slurry from said object to said first container;

monitoring the level of slurry in said first container after said

excess slurry is returned to said container to determine the change of level from a predetermined level;

sensing the specific gravity and viscosity of the slurry dispensed to said object;

comparing the sensed specific gravity and viscosity to predetermined values;

generating error signals representative of the differences between said sensed values and said predetermined values;

providing calculated error signals, and comparing said generated error signals with a previous error signal and using the difference between said generated and said previous error signals when said generated error signal exceeds said previous error signal, and using the difference between said generated error signal and a calculated error signal when said previous error signal exceeds said generated error signal;

providing a supply of a first material having a specific gravity greater than the predetermined specific gravity of said slurry, providing a supply of a second material having a viscosity greater than the predetermined viscosity of said slurry, and providing a supply of a third material; and

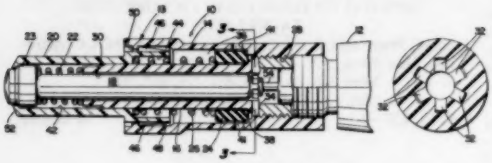
utilizing said error signals to add said first, second and third materials to said first container in amounts necessary to bring the specific gravity, viscosity and level of said slurry to values approximately equal to said predetermined values.

4,445,527

VALVE EXTENSION

Richard C. Leimbach, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 16, 1982, Ser. No. 399,065
Int. Cl.³ F16K *15/20*
U.S. Cl. 137—226 **9 Claims**



1. An extension adapted for attachment to the valve stem assembly of a pneumatic tire comprising a housing having a longitudinal bore and an enlarged bore adjacent to one end thereof, threads formed in said enlarged bore for attachment to said valve stem, an elongated valve actuating member received in said elongated bore and engageable with said valve stem assembly, an annular recess formed in said housing coaxial with said longitudinal bore, a wall defined by the intersection of said longitudinal bore with said enlarged bore, one or more ports formed through said wall, a channel formed at the end of said recess and intersecting said one or more ports to define a flow path between said enlarged bore and said annular recess, a valve element received within said annular recess, and means received within said recess for biasing said valve element into a position closing said flow path.

4,445,528

ELECTROMAGNETIC VALVE AND METHOD FOR ASSEMBLY

Nobuaki Miki, and Shoji Yokoyama, both of Anjo, Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1981, Ser. No. 281,446
Claims priority, application Japan, Jul. 14, 1980, 55-96007
Int. Cl.³ F16K *11/07, 31/02*
U.S. Cl. 137—315 **16 Claims**

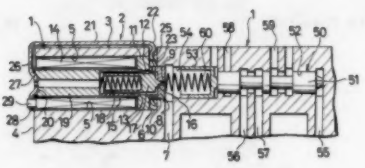
1. An electromagnetic valve, comprising:

a housing of a hydraulic control system in which said electromagnetic valve is incorporated for operation, said housing having a portion defined by intersecting first and second wall surfaces, and a fluid conduit in said housing;

a cavity, said cavity being formed into said second wall surface and opening onto said second wall surface;

a groove formed into said first wall surface and opening onto said first wall surface and intersecting said cavity and cavity communicating with a portion of the cross-sectional area;

components of an electromagnetic valve, said components being functionally arranged within said cavity and adapted for opening and closing a pathway of communication with said fluid conduit when said valve is actuated, the interior surfaces and walls of said cavity being the casing for said valve components;



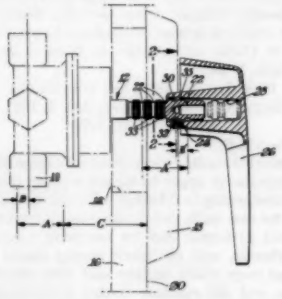
a retainer, said retainer being formed in a U-shaped bracket from a spring material and having two ends and an intermediate portion, one said end having wavy undulating portions, said one end being inserted and resiliently held in said groove by means of said wavy undulating portions and engaging at least one said functionally arranged valve component, the other said end covering at least in part the entrance of said cavity at said second wall surface and engaging at least one said functionally arranged valve component, said valve components being retained between said two ends of said retainer by the resilient force thereof and at least in part within said cavity, by the resiliency of said bracket said bracket both holding said valve components together and also holding said valve in place on said housing.

4,445,529

ADJUSTABLE VALVE HANDLE

Carmen J. Lagarelli, Clayton, Del., assignor to Speakman Company, Wilmington, Del.

Filed Aug. 31, 1981, Ser. No. 297,735
Int. Cl.³ F16L *5/02*
U.S. Cl. 137—360 **3 Claims**



1. An adjustable valve operator for use with a valve recessed in a wall, comprising a valve body capable of being located inside the wall at varying distances from the outer surface of the wall, a valve stem extending from the valve body at varying distances beyond the outer surface of the wall depending

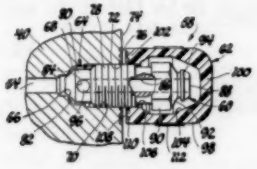
upon the location of the valve body, the valve stem having splines along its length and non-frangible, spaced circumferential grooves thereon which interrupt the splines at regular spaced intervals on the stem, a handle slidable onto said stem having an elongated bore therein to facilitate substantial movement of the handle relative to the stem and placement of the handle close to the outer surface of the wall and threaded securing means located in a threaded bore in the handle aligned transverse of the stem, the securing means having an inner tapered surface arranged for mating engagement with the outer surface of one of the circumferential grooves on the stem whereby the handle can be affixed to the stem in close proximity to the outer wall.

4,445,530

CORROSION PROTECTOR FOR WHEEL BRAKE ASSEMBLY BLEEDER VALVE

Richard D. Meixell, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 3, 1982, Ser. No. 374,405
Int. Cl.³ F16K *27/08*
U.S. Cl. 137—381 **4 Claims**



1. In a vehicle brake assembly occasionally exposed to corrosive agents and having a housing defining a hydraulic fluid chamber adapted to communicate with atmosphere through a bleed passage, the improvement comprising:

means coacting with said housing at said bleed passage in a manner to facilitate the bleeding of air from said chamber while preventing corrosion by said corrosive agents, said means including

a bleeder valve unit threaded into said bleed passage and having threads positioned outside as well as inside said bleed passage, said bleeder valve unit having a head outwardly adjacent said threads in axially spaced relation thereto, said head having a larger lateral dimension than the lateral dimension of said threads;

and a protection cap having a flexible body defining an open-ended cavity for receiving therein said bleeder valve unit head and outside threads, the body of said cap at said open end having internal threads adapted to engage the threads of said bleeder valve unit positioned outside said bleed passage and external seal-enhancing land-and-groove means adapted to sealingly engage said housing when said bleeder valve unit is received in said cavity and after the internal threads of said cap engage the outside threads of said bleeder valve unit,

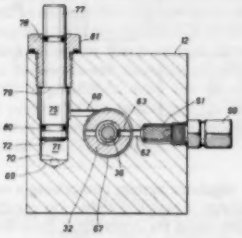
said cap being sufficiently flexible to be axially pushed over said bleeder valve unit head until the internal threads of said cap move past said head and then threadedly engage the outside threads of said bleeder valve unit, said cap thereafter being twistable in coaction with said outside threads to thereafter sealingly engage the land-and-groove means with the housing, said cap being removable for bleeding air and replaceable for preventing exterior corrosive agents from corroding said unit and particularly said threads.

4,445,531

PILOT FOR SAFETY VALVE

Walter W. Powell, Houston, Tex., assignor to Anderson, Greenwood & Co., Houston, Tex.

Filed Aug. 5, 1981, Ser. No. 290,231
Int. Cl.³ F16K *31/36*
U.S. Cl. 137—489 **13 Claims**



1. A pilot valve for control of a safety relief valve which safety relief valve exposed to an inlet pressure wherein the inlet pressure is selectively relieved by operation of the safety relief valve and wherein the pilot valve controls the safety relief valve by selectively applying control pressure to the safety relief valve to close the safety relief valve and by selectively reducing the control pressure to open the safety relief valve, the pilot valve comprising:

(a) a pilot valve body having a chamber therein;

(b) a valve seat in said valve body chamber;

(c) a movable piston means selectively closing against said valve seat in said valve body and incorporating a transverse face thereon adapted to be exposed to the inlet pressure and further incorporating a second and opposing face adapted to be acted against by a resilient means;

(d) first means for introducing fluid through an inlet line at a pressure determined by the inlet pressure for the safety relief valve, said first means placing pressure on said piston means in such a manner as to provide opposing forces acting on said piston means which forces tend to open or close said piston means relative to said valve seat;

(e) an outlet line from said pivot valve extending to the pressure relief valve to conduct control pressure to the pressure relief valve for control of opening and closing of said pressure relief valve; and

(f) indicator means responsive to pressure in said inlet line and said outlet line for forming an indication of the operative state of said piston means of said pilot valve wherein said indicator means includes:

(1) a cylinder formed in said valve body;

(2) a piston slidably in said cylinder;

(3) a first area on said piston adapted to be exposed to a first pressure;

(4) a second area on said piston, said second area opposing said first area and further being adapted to be exposed to a second pressure acting on said second area;

(5) first and second flow line means in said body for applying the pressures in the inlet line and the control pressure in the outlet line to the first and second areas of said piston respectively; and

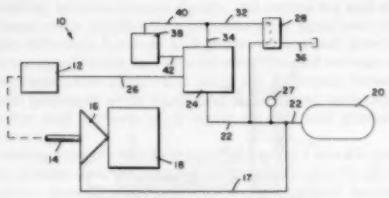
(6) guide means for guiding said piston between first and second positions wherein the movement between said positions indicates the relative operative state of the pilot valve in a pressure dependent relationship.

4,445,532

PRESSURE REGULATOR SYSTEM

John D. Mitchell, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 15, 1979, Ser. No. 85,151
Int. Cl.³ F17K *31/124*
U.S. Cl. 137—495 **62 Claims**



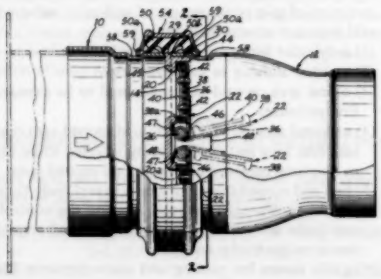
1. A pressure regulator system comprising a relatively high pressure fluid source; a pressure reduction regulator having a pressure reduction valve for controlling fluid flow between a high pressure inlet coupled to said fluid source and a low pressure outlet; pressure balancing means for controlling the position of said reduction valve for controlling the fluid pressure in said outlet, said balancing means including a balancing piston movably engaging said reduction valve and received in a complementary-formed cylinder, said piston having first end opposite said reduction valve with a surface area generally corresponding with the effective surface area of said reduction valve exposed to high fluid pressure, a second end with relatively enlarged surface area communicating with said low pressure outlet, and a radially expanding, axially sloping intermediate portion extending within said cylinder and interconnecting said first and second ends of said piston; means for applying pressure from said fluid source to said first end for pressure-balancing opposite ends of said reduction valve; and means for applying a controlled reference fluid pressure to said intermediate portion for urging said reduction valve only toward a position open to fluid flow, the fluid in said outlet serving to pressure-balance said intermediate portion and said second end of said piston whereby the fluid pressure in said outlet is related to said reference pressure in a predetermined manner.

4,445,533

AIR CHECK VALVE ASSEMBLY FOR POWDERED BULK PRODUCT TRANSPORT

Joseph H. DeFrees, Warren, Pa., assignor to Allegheny Valve Company, Warren, Pa.

Filed Aug. 13, 1981, Ser. No. 292,655
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—512.1 **12 Claims**



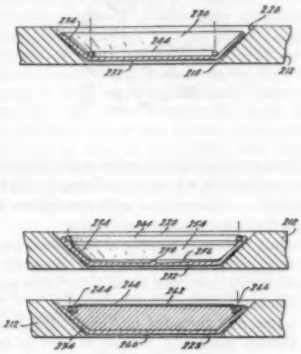
1. An air fluid check valve adapted for ready insertion therein and removal from the interior of a conduit assembly at a separable joint therein, the conduit assembly being adapted for use for instance on a bulk hauling transport vehicle for powdered solids, comprising a valve body having means thereon for locating the valve in generally centered condition in the interior of the conduit assembly at said joint, said body having an opening therethrough for the passage of fluid, a spring loaded valve plate pivotally mounted on said body and adapted to be urged in a direction to close said opening, but being pivotal to an open position upon application of predetermined fluid pressure in the conduit assembly to said valve plate, for permitting passage of fluid through said valve opening, resilient seal means adapted to coact in sealing relation with said valve body, for sealing the separable joint of the conduit assembly and for preventing leakage of fluid from interiorly of the conduit assembly externally of the valve, and wherein said seal means comprises a seal member adapted to encompass the conduit joint and to coact in sealing relation with said means on said valve body.

4,445,534

VALVE ASSEMBLY

Robert W. King, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 219,849, Dec. 23, 1980, Pat. No. 4,368,755, which is a continuation of Ser. No. 971,309, Dec. 20, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,322
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—512.3 **33 Claims**



1. A discharge valve element for use in a gas compressor having a valve plate equipped with an inner surface in part defining a compression chamber, a discharge port and valve seat extending through said valve plate and diverging outwardly from said inner surface, said valve element having an outwardly diverging seating surface and being formed from sheet metal of a thickness rendering it capable of distorting to conform to the valve seat with an inner surface of said valve element lying substantially in the plane of said inner surface of said valve plate when the discharge valve element is closed, said distortion resulting in a reactive force tending to unseat said discharge valve element.

4,445,535

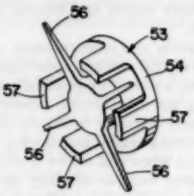
MEDICATION INFUSION PUMP

William B. Mayfield, Costa Mesa, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 252,779, Apr. 10, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,020
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—535 **2 Claims**

1. An integral one-piece check valve for use with a cooperating valve surface, said check valve comprising:

a generally disk shaped base;
an annular valve seat on one side of said base;
a plurality of spring fingers that extend radially from a central hub disposed on the other side of said base; and



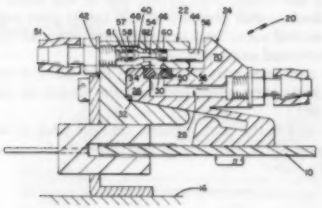
a plurality of axially extending stop members disposed on said other side of said base, said stop members extending axially between adjacent ones of said radially extending spring fingers.

4,445,536

ELECTRONIC-PNEUMATIC CIRCUIT BOARD COUPLING

John G. Willis, Chelmsford, Mass., assignor to Linear Dynamics, Inc., East Pepperell, Mass.

Filed May 21, 1982, Ser. No. 380,526
Int. Cl.³ F16L *37/28*
U.S. Cl. 137—560 **1 Claim**



1. In a coupling for effecting pneumatic connection between a rack and a circuit board carrying both electrical and pneumatic control elements where concurrent connection is made of electric and pneumatic circuits as the circuit board is inserted in the rack, the coupling comprising a male unit with a wedge shaped insertion probe penetrated by a flow channel terminating in an interconnection port and a female unit with an opening for receiving the insertion probe of the male unit and an interconnection port mating across an interface surface with the male interconnection port, the interface surface between the male and female units being approximately parallel to the direction of motion as the male unit is inserted into the female unit, the improvement wherein

said female coupling unit has a tunnel passing therethrough, open at both ends, and oriented to be approximately parallel to said interface surface, said tunnel having a uniform bore in a region adjacent its distal end and having an enlarged bore near its proximal end, said tunnel having at its proximal end means for connection to a pneumatic channel, said female coupling unit having an internal channel communicating between its interconnection port and the uniform bore portion of the tunnel,

said female coupling unit including a shuttle with axial symmetry having an actuator shaft of a diameter, to slide within the uniform bore portion of the tunnel at one end, a stop that cannot enter the uniform bore portion of the tunnel at the other end, two spaced apart seals of a diameter to make a sealing fit to the uniform bore portion of the tunnel positioned intermediately, a portion of the shuttle between the seals being of a diameter less than that of the uniform bore portion of the tunnel, said shuttle being, when the coupling is disengaged, positioned in said tunnel by biasing means with its actuator shaft extending out the distal end of the tunnel and both seals within and engaging the uniform bore portion of the tunnel, the proximal seal being positoned between the internal communicating channel and the enlarged bore portion of the tunnel, and the distal seal being positioned between the internal communicating channel and the distal end of the tunnel, and

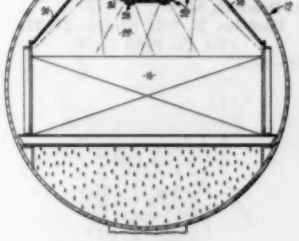
said male coupling unit including affixed thereto a projection positioned to engage the actuator shaft of the shuttle and as the coupling units are coupled press the shuttle against the biasing means in the proximal direction along the tunnel so that when the coupling units are fully coupled the shuttle is positioned with the proximal seal in the enlarged portion of the tunnel and the distal seal is positioned between the internal communicating channel and the proximal end of the tunnel.

4,445,537

BOILER FEED WATER DEAERATOR SPRAY VALVE TURBULENCE SHIELD

Roderick E. Athey, Overland Park, Kans., and Alan G. Furnish, Kansas City, Mo., assignors to Marley Company, Mission Woods, Kans.

Continuation-in-part of Ser. No. 307,330, Oct. 1, 1981. This application Sep. 30, 1982, Ser. No. 424,878
Int. Cl.³ E03B *11/00*; B01D *19/00*
U.S. Cl. 137—572 **11 Claims**



1. A boiler feed water deaerator, comprising:

an elongated, generally horizontally disposed tank;

feed water receiving structure within said tank and extending along the length thereof;

elongated wall means within said tank and extending along the length thereof above said water receiving structure for defining, with proximal wall surfaces within said tank, an incoming feed water box above the wall means, and a feed water spray region beneath the plate and above the water receiving structure,

said wall means including structure defining a series of rows of apertures therethrough extending along the length of the wall means, said apertures serving to communicate said box and region;

means defining a feed water inlet in communication with said box, at least certain of said apertures being horizontally spaced from said inlet;

a valve for each of said apertures for regulating water flow therethrough, each of said valves including

an elongated, generally tubular and upright turbulence shield defining a passageway therethrough, and an inlet and an outlet adjacent respective ends of the passageway;

means mounting said turbulence shield on the face of said

wall means remote from said region with the longitudinal axis of the shield being substantially aligned with the axis of the associated adjacent aperture;

a valve plug;

a stem secured to said plug and at least partially disposed within said shield and extending along the length thereof;

means mounting the valve plug within said shield and adjacent said outlet thereof for movement of the plug between a flow-blocking position blocking communication between said box and region, and an open position communicating said box and region and permitting flow of water from the box, through the shield and associated aperture and into said region,

said valve mounting means comprising structure adjacent said inlet end of said shield for supporting said plug and stem for reciprocal movement thereof axially of the shield, and for supporting the stem and plug for pivoting movement thereof about an axis transverse to the longitudinal axis of said shield and proximal to the inlet end of the shield; and

means for biasing said plug to said flow-blocking position thereof,

the ratio of the axial length of said shield to the internal diameter thereof being at least 1 for protecting said valve plug and stem from the effects of the horizontal component of incoming feed water from said inlet, and for directing water entering said shield inlet substantially axially along said passageway prior to discharge of water through said outlet, in order to lessen turbulence and valve plug vibration.

4,445,538

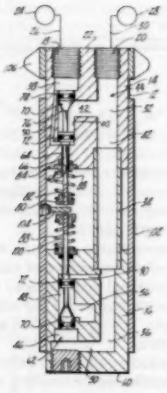
BIDIRECTIONAL CONTROL VALVE

Gerard W. Bilski, Livonia, Mich., assignor to Tri-Motion Industries, Inc., Dearborn, Mich.

Filed Jun. 29, 1981, Ser. No. 278,731

Int. Cl.³ F15B *13/04*

U.S. Cl. 137—596.2 **8 Claims**



1. A fluid control valve comprising:

an elongated housing, said housing having an inlet port, outlet port and exhaust port formed on at least one of its axial ends,

first fluid passage means formed in said housing for fluidly connecting said inlet port to said outlet port,

second fluid passage means formed in said housing for fluidly connecting said outlet port to said exhaust port,

a first valve operatively disposed in said first fluid passage means and movable between an open and a closed position,

means for resiliently urging said first valve towards its closed position,

a second valve operatively disposed in said second fluid passage means and movable between an open and a closed position,

means for resiliently urging said second valve towards its closed position,

means for selectively and independently moving said first valve and said second valve to their respective open positions comprising a sleeve longitudinally slidably mounted to said housing and an actuating member secured to and extending radially inwardly from said sleeve, said actuating member abutting against and moving said first valve to its open position when said sleeve is slid in one direction and said actuating member abutting against and moving said second valve to its open position as said sleeve is slid in the opposite direction and wherein and first and second valves can be opened only mutually exclusively,

wherein said first and second valves are elongated and slidably received in valve bores formed in the housing, and

wherein said first and second valves each have at least two axially spaced lands, one side of one first valve land being open to said inlet port so that pressure at said inlet port urges said one first valve land in one axial direction and a first fluid passageway for fluidly connecting said inlet port to one side of the other first valve land so that pressure at said inlet port urges said other first valve land in an axial direction opposite from said one axial direction, one side of one second valve land being open to the outlet port so that pressure at said outlet port urges said one second valve land in a predetermined axial direction and a second fluid passageway formed in said housing for fluidly connecting said outlet port to one side of the other second valve land so that pressure at said outlet port urges said other second valve land in a direction opposite from said predetermined axial direction,

whereby said inlet port pressure on said sides of said first valve lands exert equal and opposite forces on said first valve and

whereby said outlet port pressure on said sides of said second valve lands exert equal and opposite forces on said second valve.

4,445,539

DIP TUBE AND VALVE WITH QUICK-DISCONNECT COUPLING FOR A COLLAPSIBLE CONTAINER

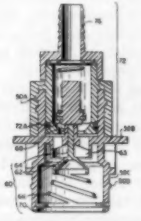
William S. Credle, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 58,866, Jul. 19, 1979, Pat. No. 4,286,636.

This application Apr. 23, 1981, Ser. No. 256,696

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.03 **9 Claims**



1. In a system for dispensing syrup from a container, said container including a fitment for defining an opening through which said syrup passes, the improvement comprising:

a first coupling member having first and second open ends connected by a central bore, said second open end being connected to said fitment;

a first self-sealing valve disposed in said central bore includ-

ing means in said bore defining a valve seat, a valve member movable into or out of sealing engagement with said valve seat, spring means for normally biasing said valve member into sealing engagement with said valve seat, and a first actuating stem coupled to said valve member and extending toward said first open end of said first coupling member;

a second actuating stem rigidly affixed in said bore inboard of the walls thereof adjacent said first actuating stem and extending toward said first open end of said first coupling member, said second actuating stem being supported at the center of a plurality of radial spokes extending from and affixed to said bore walls, said radial spokes defining fluid flow openings therebetween, said second actuating stem having a channel therethrough for guiding and supporting said first actuating stem; and

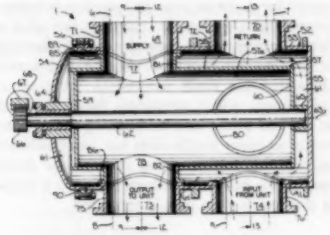
a second coupling member for engaging said first open end of said first coupling member, said second coupling member including means for engaging said first actuating stem to move said valve member out of engagement with said valve seat when said first and second coupling members are fully engaged and a second self-sealing valve which is opened by said second actuating stem when said first and second couplings are fully engaged.

4,445,540

SLEEVE-TYPE FLUID FLOW DIVERTER

Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Oct. 27, 1981, Ser. No. 315,290
Int. Cl.³ F17D *1/00*
U.S. Cl. 137—625.43 **24 Claims**



1. A diverter valve for connection between a source of pressurized fluid and a process device, comprising, in combination:

(a) an enclosing housing having a longitudinally extending generally cylindrical wall and end walls,

(b) a sleeve disposed concentrically within said housing and with said sleeve having a longitudinally extending generally cylindrical wall and end caps,

(c) means mounting said sleeve coaxially within said housing,

(d) motive means for rotating said sleeve between a pair of operative normal and reverse fluid flow positions,

(e) a pair of upstream supply and return ports disposed in said housing for connection to the fluid source,

(f) a pair of downstream output and input ports disposed in said housing for connection to the process device,

(g) multiple port means disposed in the said generally cylindrical wall of said sleeve for selectively connecting said housing supply and return ports to one or the other of said housing output and input ports depending upon the operative position of said sleeve,

(h) said sleeve forming a single internal chamber connecting said multiple port means for flow of fluid through said internal chamber when at least some of said multiple port means register with one of said upstream and one of said downstream housing ports,

(i) said housing and sleeve being spaced to form a single external chamber therebetween, and with said external chamber extending about said wall and end caps of said sleeve,

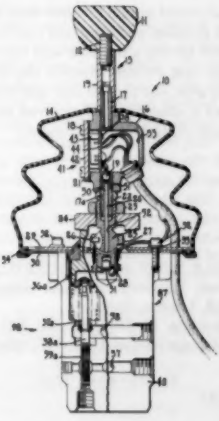
(j) and said external chamber providing for flow of fluid therethrough between one of said upstream and one of downstream housing ports in both normal and reverse fluid flow operative positions of said sleeve.

4,445,541

HYDRAULIC REMOTE CONTROL JOYSTICK

Herbert H. Schmiel, Fridley, Minn., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 6, 1981, Ser. No. 280,473
Int. Cl.³ F16K *31/02, 31/44*
U.S. Cl. 137—636.2 **13 Claims**



1. A joystick controller having a handle which has an axis with respect to which it is pivoted about a point and a means for transmitting a movement in the handle to a plurality of auxilary spools, the auxiliary spools actuating a plurality of remote direction control spools to remotely control hydraulic directional control valves and the movement controlling a device for actuating a pressure build-up in an actuator circuit comprising:

(a) radiant energy means carried by the handle and emitting radiant energy generally parallel to a longitudinal axis of the handle;

(b) means for receiving said radiant energy and providing a control signal dependent upon a relative movement of the handle, thereby controlling the device that is operable by said control signal; and

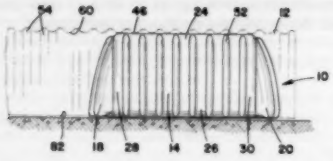
(c) a receptacle positioned between said radiant energy means and said receiving means, said receptacle having a hole to allow the radiant energy to be received by said receiving means when said handle is in a neutral position and said receptacle to block said radiant energy when the handle moves off the neutral position.

4,445,542

ARCH END CAP

James L. Fouss, and John J. Parker, both of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Nov. 20, 1981, Ser. No. 323,410
Int. Cl.³ F16L 55/10; E02B 11/02
U.S. Cl. 138—94 22 Claims



1. An end cap for an arch conduit comprising:

a first arcuate side wall having a first apex area, a first base area, a first one terminal end area and a first other terminal end area;

a second arcuate side wall having a second apex area, a second base area, a second one terminal end area and a second other terminal end area, said first apex area and said second apex area being joined to form an end cap apex;

a one end wall joined to said first one terminal end area, said second one terminal end area, and said end cap apex, said one end wall having a one end wall base area; and,

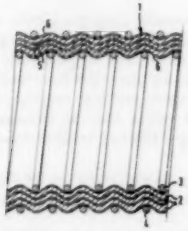
an open-ended base defined adjacent the first base area, the second base area, and the one end wall base area, whereby said end cap is adapted to be received into said arch conduit for obstructing said arch conduit.

4,445,543

FLEXIBLE HOSE FOR LIQUEFIED GASES

Howard B. Mead, Tarporley, England, assignor to Shell Research Limited, London, England

Filed Sep. 20, 1982, Ser. No. 419,952
Claims priority, application United Kingdom, Oct. 2, 1981, 8129791
Int. Cl.³ F16L 11/11
U.S. Cl. 138—122 12 Claims



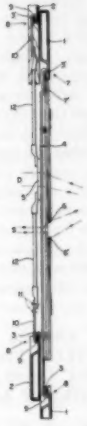
1. Flexible hose for liquified gases, with improved fatigue-resistance, which remains flexible at cryogenic temperatures, and which is impermeable to liquids and gases, comprising a tubular body of biaxially oriented polypropylene film arranged between an inner helically wound wire and an outer helically wound wire, said wires being wound at the same pitch but having the windings displaced by half a pitch width from each other.

4,445,544

LENO-SELVAGE FORMING DEVICE

Valentin Krumm, Hergensweiler, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,686
Int. Cl.³ D03C 7/00
U.S. Cl. 139—54 8 Claims



1. In a device for forming a leno selvage on fabrics made on shuttleless weaving machines, comprising a rail-like leno body mounted to upper and lower heddle slide bars and acting as a support means for pairwise arranged needles pointing toward each other and with eyelets for pairwise provided standard threads, further comprising a control means displaceable parallel to the needles and provided with control apertures for pairwise provided leno yarns,

the improvement which comprises fastener means at the upper rail end of the leno body fixing the position of the device on an upper heddle slide bar, and quick-fit fastener means securing the remaining ends of the device to be fastened to the heddle slide bars, whereby a displacement along the heddle slide bars is permitted.

4,445,545

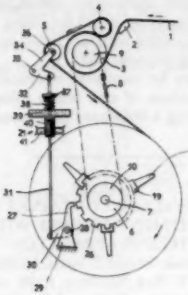
DEVICE FOR WINDING A PIECE OF FABRIC UNDER CONSTANT TENSION, ESPECIALLY FOR A WEAVING LOOM

Yves Juillard, and Christian Varloud, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

Filed May 3, 1982, Ser. No. 373,863
Claims priority, application France, May 12, 1981, 81 09395; Oct. 27, 1981, 81 20126
Int. Cl.³ D03D 49/20
U.S. Cl. 139—311 10 Claims

1. A device for automatically regulating the winding tension of a fabric produced by a weaving loom, in which the winding roller or drum is driven in rotation from the fabric take-up roller by means of a friction coupling, wherein said regulating device comprises a tensioning roller which is displaceable

under the action of the tension of the fabric, and a mechanism for transmitting the displacement of said roller to a device for



locking a nut which tightens-up the friction coupling when the tension of the fabric has decreased.

4,445,546

METHOD OF OPERATING A WEAVING MACHINE

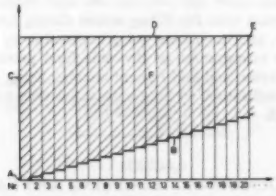
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 15, 1981, Ser. No. 330,797

Claims priority, application Switzerland, Dec. 17, 1980, 9296/80

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **4 Claims**



1. A method of picking a weft yarn through a yarn travelling zone defined by a sequence of fluid discharge nozzles, and disposed across the weaving width of a weaving machine, said method comprising the steps of

sequentially actuating each nozzle in said zone to eject a fluid medium into said zone for propelling the weft yarn along said zone; and

thereafter de-activating the nozzles simultaneously upon termination of picking of the weft yarn through said zone.

4,445,547

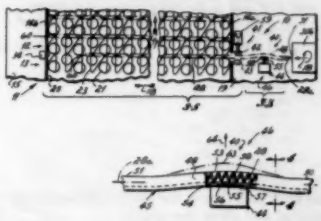
LACING WIRE STOP MECHANISM FOR A COIL SPRING ASSEMBLY MACHINE

Terry L. Aronson, Pell Lake, Wis., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 10, 1981, Ser. No. 300,813

Int. Cl.³ B21F *21/00*

U.S. Cl. 140—92.3 **14 Claims**



1. Coil spring assembly apparatus for lacing coil spring end loops together to form a coil spring assembly, said apparatus comprising

lacing wire feeding apparatus adapted to feed a spiral lacing wire along a linear axis into lacing relation with adjacent coil spring end loops in adjacent coil spring rows to form said coil spring assembly,

a lacing wire stop mechanism comprising a guide element interposed between said lacing wire feeding apparatus and said coil spring rows for guiding said spiral lacing wire from said feeding apparatus into lacing relation with said adjacent spring rows, said guide element having a guide section through which said spiral lacing wire is guided, said guide section defining a normal path of travel of said spiral lacing wire which is bowed out of axial linearity with said lacing wire as it moves between said feeding apparatus and said spring assembly, and said lacing wire normally being in contact with and guided by said bowed guide section so as to establish a continuous bowed configuration of said lacing wire within said bowed guide section as said lacing wire laces adjacent coil spring rows together, and

sensing means operatively connected with said guide element and with said lacing wire feeding apparatus, said sensing means being operative to sense when said lacing wire bows outwardly away from said normal bowed path of travel defined by said guide element's guide section in response to an obstacle encountered by the leading end of said lacing wire as said lacing wire is being wound in lacing fashion about the coil spring end loops, said feeding apparatus being stopped in response to the sensing of said obstacle.

4,445,548

FOOD PORTIONING MACHINE

Franz Neumann, 138 Dieppe Ave., Pointe Claire, Quebec, Canada (H9P 1X6)

Filed Jan. 25, 1982, Ser. No. 342,201

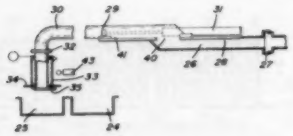
Int. Cl.³ B65B *1/04*

U.S. Cl. 141—1 **7 Claims**

1. In a portioning machine for filling containers with food material, the machine having at least two filling stations, and a pumping means to supply food material, each filling station adapted to hold a container, the improvement comprising, a supply conduit leading to a filling tube, said supply conduit being comprised of a sliding portion and a stationary portion, said sliding portion horizontally and externally overlapping said stationary portion to form a non-coaxial telescoping joint, said sliding portion having a slot which connects and overlaps with an aperture in the stationary portion, such that food material is pumped from pumping means through the station-

ary portion to the slide portion when the filling tube is positioned in either filling station,

a telescopic nozzle at the end of the filling tube to extend downwards into a container in the filling station, and



a combined knife and flap at the end of the nozzle to cut the food material and close the nozzle.

4,445,549

ARRANGEMENT FOR A BOTTLE HANDLING MACHINE

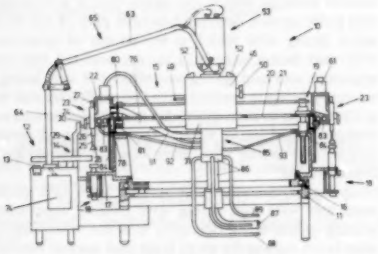
Herbert Bernhard, Wolfsheim, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,243

Claims priority, application Fed. Rep. of Germany, Feb., 1981, 3104187

Int. Cl.³ B67C *3/28*

U.S. Cl. 141—148 **8 Claims**



1. A bottle filling machine, comprising:

a lower machine part;

an upper machine part rotatably mounted on said lower machine part;

a circular ring machine table connected to said upper machine part;

uniformly spaced apart, vertical lift elements for bottles to be filled, said lift elements being associated with said machine table;

a traverse connected to said machine table in such a way as to be adjustable in height relative thereto, said traverse being provided with a pan-shaped recessed portion arranged concentric to the axis of rotation of said upper machine part, said recessed portion being part of a receiving chamber for a control device, which is in the form of a digital computing system, and for the power supply and terminals associated with said control device; said receiving chamber, as an extension of said recessed portion of said traverse, being further delimited by a protective shell, which is mounted on said recessed portion in such a way as to be movable up and down, and by a plate mounted on said protective shell and having a central opening;

a column supported by said plate over said central opening thereof;

a circular ring liquid container connected to said traverse and provided with filling elements respectively associated with respective ones of said lift elements;

a central inflow fitting connected to said recessed portion of said traverse and operatively connected to said liquid container for supplying liquid for filling bottles thereto;

control means associated with said liquid container for monitoring the filling process; and

a rotary distributor for supplying electrical energy to drive and control devices of said bottle filling machine, said distributor having a stationary part mounted on said column.

4,445,550

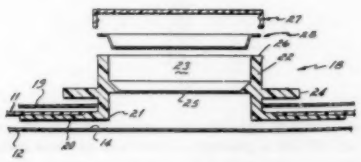
FLEXIBLE WALLED CONTAINER HAVING MEMBRANE FITMENT FOR USE WITH ASEPTIC FILLING APPARATUS

John C. Davis, Palatine; Ronald J. Reiss, Hoffman Estates, both of Ill., and Albert F. Rica, Stockton, Calif., assignors to Fran-Rica Mfg. Inc., Stockton, Calif. and Container Technologies, Inc., Barrington, Ill.

Filed Aug. 20, 1982, Ser. No. 409,903

Int. Cl.³ B65D *41/50*

U.S. Cl. 141—329 **18 Claims**



1. For use with an asceptic filling apparatus having a filling chamber adapted to be sterilized and provided with an opening for the passage of asceptic filling means, an asceptic container for the storage of flowable food product comprising: gas impermeable walls, a rigid fitment member sealed to one of said walls and detachably receptive in the opening of the filling chamber to effect sealed connection therebetween; a rupturable membrane closing said fitment member and located axially inwardly of the outer end thereof, and seal means to effect sealed connection with the filling means during the filling of said container, said membrane being rupturable by the filling means for the introduction of flowable food product to the container's interior, and said fitment member being capable of gamma ray sterilization without substantial embrittlement or loss of strength.

4,445,551

QUICK-DISCONNECT COUPLING AND VALVE ASSEMBLY

Curtis J. Bond, 4611 Donithen Rd., Marion, Ohio 43302, and John G. Ulm, Orchard Dr., Upper Sandusky, Ohio 43351

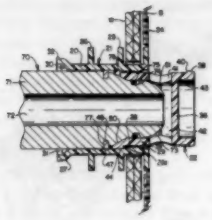
Filed Nov. 9, 1981, Ser. No. 319,580

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—349 **19 Claims**

1. A coupling and valve assembly comprising a spout having an annular tubular body open at its inner and outer ends, a valve member having an annular tubular body telescoped in the spout body and axially-slideable therein and having a closed inner end and an open outer end to provide an outwardly-opening socket for receiving a connector with the valve body having a dispenser outlet leading into the socket, a seal between the valve body and spout body axially inwardly of the dispenser outlet, one-way stop means between the valve body and spout body which prevents axial outward movement of the valve body in the spout body to keep the seal between the valve body and spout body but permits axial inward movement of the valve body relative to the spout body to move the

dispenser outlet axially inwardly of the inner end of the spout body to permit dispensing through said outlet and said socket; a gripper arrangement at the outer end of the valve body and spout body for gripping the connector upon insertion into the socket and movement of the valve body axially inwardly into the spout body; said gripping arrangement comprising cam means at the outer end of said spout body and radially-movable yieldable gripping means at the outer end of the valve body



normally engaging said cam means in a radially-extended position but movable positively radially inwardly by the cam means to grip the connector upon movement of the valve body axially inwardly of the spout body by the connector so as to move the outlet inwardly beyond the inner end of the spout body and to pull the valve body axially-outwardly to move the outlet into the spout body outwardly of said seal upon retraction of the connector from the spout body.

4,445,552

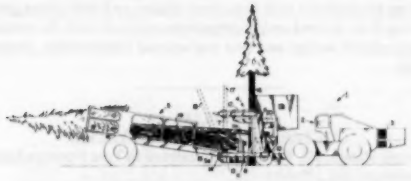
SAW BLADE CONSTRUCTION USEFUL IN THE CONTINUOUS HARVESTING OF TREES

Bruce Hyde; Wayne Tyndall; Dennis Abernethy, all of Prince Albert, and Per G. Mellgren, Pointe Claire, all of Canada, assignors to Prince Albert Pulp Company Limited, Prince Albert, Canada

Continuation-in-part of Ser. No. 90,832, Nov. 1, 1981, abandoned. This application Nov. 27, 1981, Ser. No. 325,250

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—3 D **38 Claims**



1. An apparatus for felling and harvesting trees standing along the edge of a stand of trees which comprises a tree cutting device having (a) saw means including a power driven horizontally disposed rotating circular saw blade, (b) vehicular means carrying the saw means for of advancing the saw means along a path of trees standing at the edge of a stand of trees, said saw means engaging said trees without pushing the trees when cut forwardly in relation to the direction of advancement of the saw means, (c) power means for driving the saw blade to sever trees standing in the path from their roots without pushing the trees forwardly as the cutting device moves continuously forwardly along the path, (d) cut tree collecting and guiding means carried by the vehicular means substantially along one side thereof and located at least in part adjacent the saw means for collecting trees and guiding severed trees to move and topple rearwardly in relation to the direction of advancement of the saw means in a substantially uniform direction, and (e) at least one projection located on the upper surface of the saw blade for briefing engaging and guiding rearwardly in relation to the direction of advancement the butt ends of the cut trees.

4,445,553

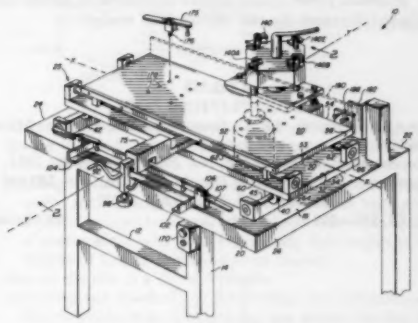
APPARATUS FOR SHAPING A WOODEN WORKPIECE

Eugene F. Hanyzewski, 8528 N. 37th Ave., Phoenix, Ariz. 85021; Kenneth A. French, 10926 N. 88th Dr., Peoria, Ariz. 85345, and Thomas S. Walker, 8741 W. Flower, Phoenix, Ariz. 85037

Filed Dec. 10, 1981, Ser. No. 329,304

Int. Cl.³ B27C *5/06*

U.S. Cl. 144—145 A **2 Claims**



1. An apparatus for shaping a workpiece to reproduce the configuration of the guide edge of a template, said apparatus comprising:

(a) a frame;

(b) a motion translating device on said frame including a carriage for said workpiece, said motion translating device including a first table slidable along bearing means in a first direction and a second table slidable along bearing means on said first table along an axis perpendicular to the direction of movement of said first table;

(c) a follower secured to said second table including means for adjusting the position of the follower with respect to the guide surface;

(d) a template holder on said frame for detachably securing a template therein, said template having a guide surface;

(e) a cutting tool including a rotatable turret having a plurality of cutting heads and means for engaging selected of the cutting heads in driven relationship with drive means, said cutting tool being positioned adjacent said carriage whereby a workpiece can be positioned on said carriage and the carriage manually manipulated with the follower in engagement with the guide surface of the template to cause the corresponding shape of the guide surface to be reproduced at the workpiece; and

(f) means for locking the said motion translating device in a fixed position.

4,445,554

LOG SPLITTER

Yasunori Suzuki, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

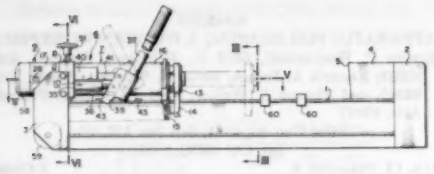
Filed Oct. 9, 1981, Ser. No. 309,940

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **2 Claims**

1. A log splitter wherein a wedge having a cutting edge and a hydraulic power unit are arranged on one end and the other ends of an I beam, and a log placed on the I beam between the wedge and the hydraulic power unit is split by pushing the log to the wedge by a ram of the hydraulic power unit, the improvement comprising,

a mechanically powered pump means and a manual group means operatively connected to each other and to said



hydraulic power unit to actuate said hydraulic power unit so as to extend the ram towards said wedge.

4,445,555

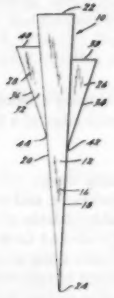
WOOD SPLITTING TOOL

Victor L. Klempirik, 540 E. Bennington Rd., Owosso, Mich. 48867

Continuation-in-part of Ser. No. 292,197, Aug. 10, 1981, abandoned. This application Dec. 21, 1984, Ser. No. 332,540

Int. Cl.³ B27L *7/00*; B26B *23/00*

U.S. Cl. 144—193 D **24 Claims**



1. A wood splitting tool comprising, in combination, a body portion of generally wedge shaped configuration and including a top surface, a pair of spaced end surfaces and a pair of oppositely angularly inclined side surfaces, said oppositely angularly inclined side surfaces of said body portion terminating in a relatively sharp edge, said tool also including a pair of flank portions disposed on said oppositely angularly inclined side surfaces of said body portion intermediate said end surfaces of said body portion, each of said flank portions including a top surface, spaced substantially parallel end surfaces of generally obtuse triangular configuration and an angularly inclined side surface, the width of said angularly inclined side surface of each of said flank portions being less than the width of said side surfaces of said body portion, the junctions of said side surfaces of said flank portions with said side surfaces of said body portion extending in a direction substantially parallel to said sharp edge, one of said flank portions being longitudinally offset on said body portion with respect to the other flank portion whereby the apex of said one flank portion is spaced longitudinally of said body portion with respect to the apex of said other flank portion, said top surfaces of said flank portions projecting outwardly from said side surfaces of said body portion beyond said top surface of said body portion whereby said flank portions provide clearance for said top surface of said body portion permitting impact forces to be applied to said top surface of said body portion to drive said sharp edge through a log when said tool is disposed completely within such log.

4,445,556

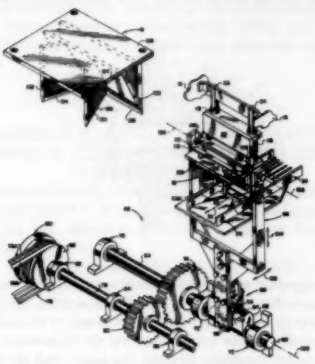
KNIFE ASSEMBLY FOR PRODUCING WOOD CHUNKS

Ray J. Williams, P.O. Box 202029, Dallas, Tex. 75220

Division of Ser. No. 218,523, Dec. 22, 1980, Pat. No. 4,378,036. This application Feb. 1, 1983, Ser. No. 462,955

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 R **1 Claim**



1. In a cutter assembly for producing wood chunks having a support platform, a shear plate mounted on said platform, a ram mounted for vertical reciprocal movement relative to said shear plate, and a power transmission assembly coupled to said ram for reciprocating said ram with respect to said shear plate, the improvement comprising a knife assembly carried by said ram for splitting a disc of wood on said shear plate, said knife assembly including a wedge cutting portion having a deflection face which converges to define a cutting edge, said deflection face being inclined relative to the plane of motion of the cutting edge, said knife assembly including a first shear blade having a cutting edge which extends transversely with respect to the cutting edge of said wedge cutting portion, a second shear blade having a cutting edge which extends tranversely with respect to the cutting edge of said wedge cutting portion and at an angle to said first shear blade, and said shear plate having first, second and third grooves aligned with the cutting edges of said wedge and first and second shear blades, respectively.

4,445,557

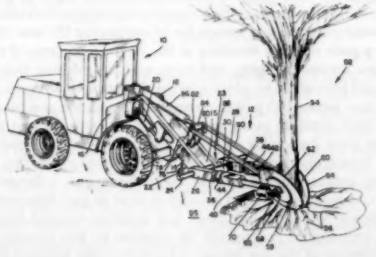
COLTER TREE CUTTING SYSTEM

Thomas Peters, III, Dublin, Ga., assignor to Tree Farmers International, Inc., Dublin, Ga.

Filed Mar. 19, 1982, Ser. No. 359,992

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—336 **14 Claims**



1. A method of severing trees and other similar objects

extending at last partially above and at least partially below the surface of the ground, said method comprising the steps of moving a frame member in a substantially horizontal plane above the ground, said frame member including a pair of circular cutting disks having sharpened peripheral edges, said disks being laterally spaced from each other and rotatably mounted on said frame member such that the imaginary planes formed by said sharpened edges of said disks are inclined from said horizontal plane and intersect at a point below the surface of the ground, such that said inclined planes have opposite slopes and such that said sharpened edge of one of said disks is substantially adjacent said sharpened edge of said other disk, and guiding said frame so that relative to said cutting disks the portion of the tree extending below the surface of the ground passes between said adjacent sharpened edges of said disks whereby the portion of the tree extending above the surface of the ground is severed from a portion of the tree extending below the surface of the ground.

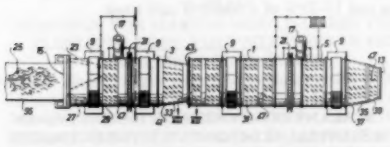
8. A method of severing trees and other similar objects having trunk portions extending at least partially above the surface of the ground and radially outwardly extended roots extending at least partially below the surface of the ground, said method comprising the steps of moving a frame member in a direction substantially parallel to the surface of said ground, said frame member including a pair of circular cutting disks having sharpened peripheral edges, said disks being laterally spaced from each other and rotatably mounted on said frame member such that said disks are tilted inwardly at the bottom edges thereof and said sharpened edge of one of said disks is substantially adjacent said sharpened edge of said other disk at a position below the surface of the ground, and guiding said frame member so that relative to said cutting disks the root portion of the tree extending below the surface of the ground passes between said adjacent sharpened edges of said disks, whereby said roots are substantially severed from said trunk below the surface of the ground.

4,445,558

BARKING DRUM AND METHOD

Kurt A. Banner, Gothenburg, and Sten-Ake Gustafsson, Edsvalla, both of Sweden, assignors to AB Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Feb. 28, 1983, Ser. No. 470,708
Claims priority, application Sweden, Mar. 19, 1982, 8201763
Int. Cl.³ B27L *1/00*
U.S. Cl. 144—341 **13 Claims**



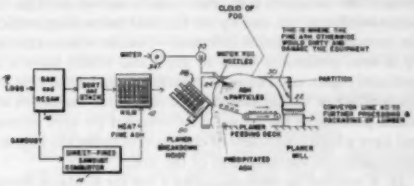
10. A method for removing waste material, such as limbs and bark, from forest raw material in a rotary barking drum, said method comprising feeding the forest raw material into a first treatment section of the barking drum while rotating the first treatment section so as to tumble the forest raw material and loosen waste material such as limbs and bark from the forest raw material, advancing the forest raw material from the first treatment section to a second treatment section of the barking drum while rotating the second treatment section so as to tumble the forest raw material and further loosen waste material therefrom, and while arresting the waste material removed from the forest raw material in the first treatment section and preventing its passage with the forest raw material to the second treatment zone, and discharging the thus arrested waste material from the barking drum through an outlet opening provided at the junction between the first and second treatment sections.

4,445,559

WATER FOG-TYPE ASH PRECIPITATOR FOR A KILNED LUMBER PILE BREAKDOWN HOIST

Cecil A. Coleman, Thomasville, Ga., assignor to Balfour Lumber Company, Thomasville, Ga.

Filed Apr. 18, 1983, Ser. No. 485,895
Int. Cl.³ F26B *9/12, 7/00*
U.S. Cl. 144—363 **5 Claims**



1. An improved timber processing system, comprising:
sawing timber to produce lumber and consequentially producing sawdust;
stacking the lumber in a multi-course pile with several generally parallel lengths in each course and at least some adjacent courses being spaced apart by a respective course of spacer sticks which run at generally right angles to the lengths of lumber in said adjacent courses;
placing the pile in a direct fired kiln;
collecting said sawdust and combusting the collected sawdust to produce an ash-laden hot gas stream, feeding the ash-laden hot gas stream to the kiln for kilning the lumber in said pile, whereby ash from the hot gas stream settles on the lumber during said kilning; and
removing the pile of kilned lumber from the kiln and breaking down said pile course-by-course and serially placing each course on a feeding deck running to a downstream work station; and
while breaking down the pile of kilned lumber course-by-course, atomizing a supply of water into a fog cloud enveloping said feeding deck adjacent said pile without substantially wetting the kilned lumber on the pile and feeding deck,
said breaking down causing much of the ash which had settled onto said kilned lumber to be jarred loose and become airborne within said fog cloud, whereby atomized water in said fog cloud attaches to said airborne ash, causing at least a substantial proportion of said airborne ash to become so heavy as to precipitate to the floor.

4,445,560

TIRE, PARTICULARLY FOR AIPLANES, WITH CROWN REINFORCEMENT OF TEXTILE CABLES AND PROCESS FOR THE MANUFACTURE THEREOF

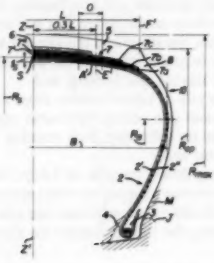
Jacques Musy, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Feb. 5, 1982, Ser. No. 346,127
Claims priority, application France, Feb. 12, 1981, 81 02789
Int. Cl.³ B60C *9/00*; B29H *5/02*
U.S. Cl. 152—200 **18 Claims**

1. A tire for airplanes having a carcass reinforcement formed of at least one ply of radial cables which is anchored to at least one bead ring in each bead and a tripartite crown reinforcement radially outwards adjacent to the carcass reinforcement and having a median portion in contact, at each of its edges, with a lateral portion, each of these three portions being formed of at least one ply of textile cables which are parallel in each ply and inclined by an angle of between 0° and 30° to the circumferential direction of the tire, the carcass reinforcement of the tire when mounted on its service rim and inflated to its service pressure but not under load having a relative camber of convexity in the crown of at most 0.12, preferably between

0.04 and 0.10, and a relative camber of convexity in the sidewalls of at most 0.14, the tire thus having a quasi-rectangular meridian profile and being characterized by the fact that when it is mounted on its service rim but not inflated, its carcass reinforcement has a relative camber of convexity in the crown of at most 0.17, preferably between 0.055 and 0.15, and a relative camber of convexity in the sidewalls of at most 0.20, and a length such that after inflation its equilibrium curve at the level of the shoulders is located radially outwards of its curve in the uninflated tire, and by the fact that the median portion of the crown reinforcement is formed of cables whose extensibility is low, preferably close to zero, and which have a low, preferably zero, coefficient of contraction under the heat at the temperature of vulcanization of the tire, while the cables of the lateral portions of the crown reinforcement are very extensible and have a high coefficient of contraction under the heat at the temperature of vulcanization of the tire.

18. A method for manufacturing a tire for airplanes having a carcass reinforcement formed of at least one ply of radial cables which is anchored to at least one bead ring in each bead and a tripartite crown reinforcement radially outwards adjacent to the carcass reinforcement and having a median portion in contact, at each of its edges, with a lateral portion, each of these three portions being formed of at least one ply of textile cables which are parallel in each ply and inclined by an angle of between 0° and 30° in the circumferential direction of the tire,



comprising vulcanizing the tire in a vulcanization mold in which the carcass reinforcement and the crown reinforcement occupy approximately the same position as in the tire when mounted on its service rim and inflated to its service pressure but not under load, the curvature of the carcass reinforcement reaching a maximum at the shoulders and a minimum at the intersection of the carcass reinforcement with the equatorial plane of the tire, the carcass reinforcement in the tire in the vulcanization mold having a relative camber of convexity in the crown of at most 0.12, preferably between 0.04 and 0.10, and a relative camber of convexity in the sidewalls of at most 0.14; the tire thus having a quasi-rectangular meridian profile;

and further comprising using a crown reinforcement in which the cables of the median portion have a low extensibility, preferably close to zero, and have a coefficient of contraction under the heat at the temperature of vulcanization of the tire which is low, preferably zero, and in which the cables of the lateral portions are very extensible and have a high coefficient of contraction under the heat at the temperature of vulcanization of the tire;

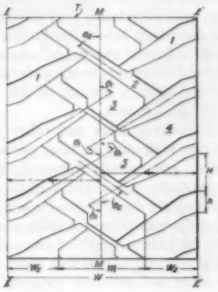
when the tire is mounted on its service rim but not inflated, its carcass reinforcement has a relative camber of convexity in the crown of at most 0.17, preferably between 0.055 and 0.15, and a relative camber of convexity in the sidewalls of at most 0.20, and a length such that after inflation its equilibrium curve at the level of the shoulders is located radially outwards of its curve in the uninflated tire.

4,445,561

LARGE SIZE PNEUMATIC RUBBER TIRE FOR ROUGH ROADS

Mitsutsugu Kono, Kodaira, and Osamu Inoue, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,798
Claims priority, application Japan, Jul. 2, 1981, 56-103518
Int. Cl.³ B60C *11/00*
U.S. Cl. 152—209 B **11 Claims**



1. A large size pneumatic rubber tire for rough roads comprising; a number of main grooves formed in a tread of the tire arranged in parallel with one another uniformly oblique in the same direction to and on both sides of a center circumferential line of the tread and opening at said tread and shoulders, a number of auxiliary grooves formed in the tread arranged substantially in parallel with one another oblique in a direction opposite to the direction of said main grooves with respect to the center circumferential line of said tire of connect said main grooves adjacent in a circumferential direction and opening at said tread, said main and auxiliary grooves having comparatively wide groove widths, respectively, and dividing said tread into a center zone and two side zones, said zones respectively consisting of circumferentially arranged respectively same shaped center blocks and side blocks defined by said main and auxiliary grooves, and side blocks having a circumferential length along tread edges, which is 120–210% of opening length of said main grooves defining said side blocks along said tread edges and 13–23% of a width of said tread.

4,445,562

SEALANT COMPOSITIONS HAVING, AS AN ESSENTIAL COMPONENT, HYDROGENATED POLYBUTADIENE AS NETWORK POLYMER

Georg G. A. Böhm, Akron; Mario DeTrano, Massillon, and James E. Hall, Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 7, 1981, Ser. No. 261,426
Int. Cl.³ B60C *5/14*; C08F *299/00*
U.S. Cl. 152—347 **9 Claims**

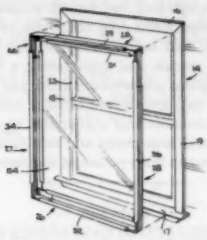
1. A pneumatic tire in combination with a sealant layer containing conventional additives and, as essential rubber components, a fully compatible blend of (1) a high molecular weight, hydrogenated polybutadiene homopolymer having a molecular weight of between 80,000 and 400,000, a vinyl content prior to hydrogenation of between 10 and 98% and a level of hydrogenation of between 40 and 98%, and (2) a low molecular weight liquid elastomer, said hydrogenated polymer providing a crosslinked network in said elastomer wherein the ratio of the polybutadiene (1) to elastomer (2) is 10–30 to 90–70.

4,445,563

ADJUSTABLE WINDOW STRUCTURE

Chester Meyeroff, 514 Waterview Dr., Cedarhurst, N.Y. 11516

Filed Jun. 30, 1982, Ser. No. 393,759
Int. Cl.[3] A47H *3/00*
U.S. Cl. 160—369 8 Claims



1. An adjustable window structure to engage a window frame having a top frame member, a bottom frame member and two side frame members defining a window area, said structure comprising:

perimeter support means comprising a plurality of angle members;

attachment means to attach pairs of the angle members together to arrange the perimeter support means to have first and second pairs of opposite sides, the angle members that comprise at least the first pair of opposite sides being telescopically nested together, whereby the perimeter support means forming the first pair of opposite sides can be slidably adjusted to engage the frame members;

clamping means including resilient channel members extending longitudinally along substantially the entire length of each edge of the angle members forming the telescopically nested sides for exerting pressure thereon and for holding the nested sides in fixed relationship to engage the window frame members firmly;

flexible sheet material having top, bottom and side edges each folded over an edge of the angle members forming the respective sides of the perimeter support means, the clamping means embracing the respective edges of the sheet material and of the respective angle members for clamping the sheet material to the sides.

4,445,564

MACHINE FOR MAKING MOULD CORES FROM FLOWABLE CORE SAND MIXTURES IN HOT MULTIPLE CORE BOXES

Vitaly A. Zitser, Dolgoprudny Moskovskoi; Leonid V. Bachelis, Moscow; Alexandr V. Melnikov, Moscow; Eduard A. Stolyar, Moscow; Vladimir S. Kushelman, Moscow; Igor I. Dreishev, Moscow; Vladimir D. Abaskalov, Karaganda; Vladimir A. Levinson, Karaganda; Vladimir A. Ivanov, and Jury E. Morozov, both of Moscow, all of U.S.S.R., assignors to Tsentralnoe Proektno-Konstruktorskoe I Tekhnologicheskoe Bjuro, Moscow, U.S.S.R.

Filed Nov. 10, 1981, Ser. No. 320,077
Int. Cl.[3] B22C *11/04, 13/12*
U.S. Cl. 164—186 2 Claims

1. A machine for making mould cores from flowable sand mixtures in hot multiple core boxes, comprising:

a supporting frame;

a conveyance means provided on said supporting frame for carrying core boxes for transfer along a path of the core production process cycle;

mechanisms mounted on said supporting frame and arranged along the path of the core production process cycle, said conveyance means transferring said core boxes to said mechanisms, said mechanisms comprising:

a sand mixture preparation mechanism,

a mechanism for pressing a sand mixture in said core boxes,

a mechanism for splitting up said core boxes, and

a mechanism for discharge of finished cores;

each of said core boxes having:

a top piece,

a bottom piece,

said top piece having central core print openings provided therein,

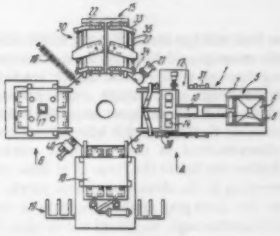
said top piece including peripheral core print openings therein on both sides of said central core print openings,

a first gate adapted to close or open said central core print openings and installed on said top piece, and

a means adapted to close or open said peripheral core print openings and comprising:

a second gate situated on said top piece and adapted to close or open said peripheral core print openings situated on one side of said central core print openings,

a third gate located on said top piece and mechanically interlinked with said second gate, and also adapted to



close or open peripheral core print openings situated on the other side of said central core print openings, and

a pullrod effecting mechanical interlinkage of the second and third gates;

a first individual drive means secured to said supporting frame at said pressing mechanism and adapted to engage said first gate for closing said central core print openings;

a second individual drive means secured to said supporting frame before said core box splitting-up mechanism and adapted to engage said first gate for opening said central core print openings;

a third individual drive means secured to said supporting frame at said pressing mechanism and adapted to engage one of said second and said third gates for opening said peripheral core print openings; and

a fourth individual drive means secured to said supporting frame before said core box splitting-up mechanism and adapted to engage one of said third and said second gates for closing said peripheral core print openings.

4,445,565

PROCESS FOR PREPARING CORES AND MOLDS

Charles E. Seeney, Brazil, and John F. Kraemer, Terre Haute, both of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 342,313, Jan. 25, 1982. This application Jul. 11, 1983, Ser. No. 512,252
Int. Cl.[3] B22C *1/18*
U.S. Cl. 164—528 6 Claims

1. An improved process for preparing foundry cores and molds from a foundry aggregate, and a binder and hardener therefor comprising the steps of (a) mixing the aggregate with a metal polyphosphate, or an ammonium polyphosphate, thereby coating the aggregate, (b) mixing the coated aggregate with a hardener comprising a source of polyvalent cations and orthophosphoric acid, and (c) packing the aggregate and binder therefor into a core box or mold box for a length of time sufficient for the binder to cure and thereby form the core or mold.

4,445,566
LATENT HEAT STORAGE MEANS

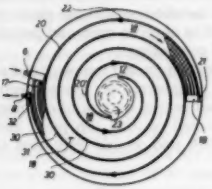
Karsten Laing, Kaiserallee 51, 7500 Karlsruhe; Oliver Laing, Weissdornweg 14, 7400 Tübingen, and Inge Laing, Hofener Weg 35-37, 7148 Remseck 2, all of Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,809

Claims priority, application Switzerland, Mar. 16, 1981, 1754/81

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—10 **13 Claims**



1. Latent heat storage means having a cylindrical housing, a heat storage mass in said housing, heat conveyor passages in said housing through which a heat carrier is adapted to flow to charge or discharge the storage mass, an inlet connector through which heat carrier flows into said housing and a discharge connector through which heat carrier flows out of said housing, characterized in that the heat conveyor passages comprise hollow bodies in the form of at least one converging spiral converging in the direction of heat carrier therethrough and at least one diverging spiral diverging in the direction of heat carrier therethrough, each said converging spiral communicating with each said diverging spiral at the center of said housing, all said spirals being concentric with said housing, a vertically extending manifold connecting all said converging spirals with one connector and a vertically extending header connecting all said diverging spirals with another connector.

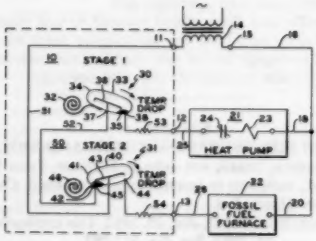
4,445,567
THERMOSTAT FOR CONTROL OF AN ADD-ON HEAT PUMP SYSTEM

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 26, 1982, Ser. No. 352,669

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—29 **10 Claims**



1. A thermostat to control the heating of a space with said thermostat adapted to be connected to control a furnace and a heat pump wherein the output heat from said furnace passes through a portion of said heat pump, including: two-stage thermostat means with a first stage including single pole switch means having a temperature control range smaller than a temperature control range of a second stage of said thermostat means; both of said stages being responsive to a temperature within said space to be heated; said switch means having contacts which are open circuited upon a temperature rise and closed circuited upon a temperature drop within said first stage temperature control range; said second stage having single pole, double throw switch means with said second stage switch means having contacts operated between open and closed positions on temperature changes within said second stage temperature control range; internal thermostat circuit means connecting said first stage switch means to said second stage switch means to allow said thermostat to complete a first electric circuit through said two switch means upon said first stage sensing a temperature drop to a limit of said first stage temperature range; said second stage switch means opening said first electric circuit and completing a second electric circuit upon a sufficient temperature drop; and terminal means connected to said two thermostat circuits with said terminal means adapted to connect said thermostat to said heat pump and said furnace; said heat pump and said furnace being controlled so that they can not operate at the same time.

4,445,568
SUPERHEATED STEAM GENERATOR

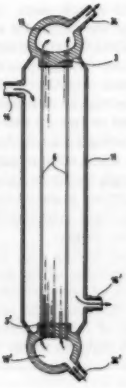
Thong Nguyen-Thanh, Cernay-la-Ville, France, assignor to Commissariat a l'Energie Atomique, Paris, France

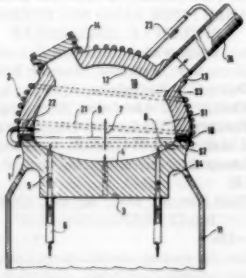
Filed Mar. 15, 1982, Ser. No. 358,181

Claims priority, application France, Mar. 20, 1981, 81 05643

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—81 **3 Claims**





1. A superheated steam generator comprising an outer ferrule having at its opposite ends a chamber for the intake of water to be vaporized and superheated and a steam outflow chamber and a group of tubes connecting said chambers in which circulates the water to be vaporized and superheated by heat exchange with a hotter fluid circulating in counterflow around the tubes within the outer ferrule, wherein the steam

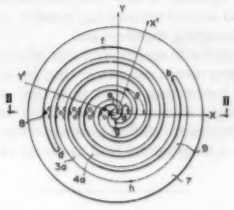
outflow chamber comprises an outer wall surrounded by a coil linked with said chamber, in such a way that part of the superheated steam introduced into the outflow chamber circulates in the coil.

4,445,569

SCROLL TYPE LAMINATED HEAT EXCHANGER

Norihide Saho; Koji Koibuchi; Kenjiro Kasai, and Hiroshi Higaki, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,277
Claims priority, application Japan, Mar. 20, 1981, 56-39467
Int. Cl.³ F28D *7/02*
U.S. Cl. 165—165 **5 Claims**



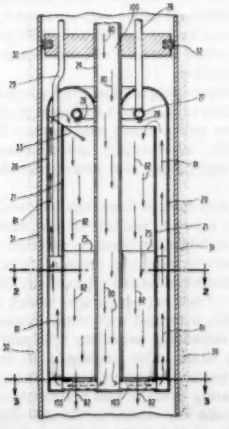
1. A scroll type laminated heat exchanger comprising a plurality of heat transfer plates having a multiplicity of holes and a plurality of spacers which are laminated alternatingly in layers to form a plurality of fluid passages so that heat is exchanged between different fluids flowing in different fluid passages by the transfer of heat through the heat transfer plates, wherein said spacers define a plurality of separate scroll-shaped fluid passages such that the passages are disposed in a side-by-side relation as viewed in the radial direction.

4,445,570

HIGH PRESSURE COMBUSTOR HAVING A CATALYTIC AIR PREHEATER

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19380

Filed Feb. 25, 1982, Ser. No. 352,216
Int. Cl.³ E21B *36/02, 43/24*
U.S. Cl. 166—59 **6 Claims**



1. A catalytic combustor for generating a mixture of steam and combustion gas downhole in an oil well, comprising:

(a) a nest of three coaxial metal pipes that define inner and outer annular passages,

(b) the wall in the inner annulus being coated with catalyst,

(c) means for directing incoming air first through the central pipe, then through the outer annulus in the opposite direction, and then through the inner annulus in the first direction, and

(d) means for mixing fuel with the air after it has traversed the outer annulus and before it has traversed the inner annulus.

4. A catalytic combustor for generating a mixture of steam and combustion gas downhole in an oil well, comprising:

(a) a nest of three coaxial metal pipes that define inner and outer annular passages,

(b) the walls of the inner annulus being coated with catalyst,

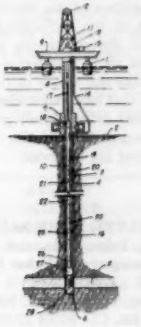
(c) means for directing a mixture of gaseous fuel and oxidizing gas first through the central pipe, then through the outer annulus in the opposite direction, and then through the inner annulus in the first direction.

4,445,571

CIRCULATION VALVE

Donald F. Hushbeck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 112,199, Jan. 15, 1980, Pat. No. 4,311,197. This application Aug. 20, 1981, Ser. No. 294,761
Int. Cl.³ E21B *34/08*
U.S. Cl. 166—317 **1 Claim**



1. A circulation valve for use in a well, said circulation valve comprising:

a cylindrical housing having an open bore therethrough and a circulating port through a wall thereof, the cylindrical housing including:

a first housing portion, the circulating port being disposed through a wall of the first housing portion, the first housing portion having an externally threaded upper end;

a second housing portion having an internally threaded lower end releasably secured to the externally threaded upper end of the first housing portion forming a radially inwardly projecting ledge in the cylindrical housing defined by an annular end surface of the upper end of the first housing portion and an internally threaded upper end; and

a third housing portion having an internally threaded upper end and an externally threaded lower end releasably secured to the internally threaded upper end of the second housing portion forming a radially inwardly projecting ledge in the cylindrical housing defined by an annular end surface of the lower end of the third housing portion;

a valve mandrel slidably received in the cylindrical housing and movable from a closed position closing the circulating port to an open position opening the circulating port, the circulating port being in fluid communication through an

inner bore of the valve mandrel with the open bore of the cylindrical housing above the valve mandrel when the valve mandrel is in the open position, the valve mandrel including:

a first valve mandrel portion slidingly received within the first housing portion of the cylindrical housing; and

a second valve mandrel portion having the lower end thereof releasably connected to the upper end of the first valve mandrel portion, the second valve mandrel portion including means for limiting movement of the valve mandrel in a first direction toward its open position, the means for limiting movement of the mandrel comprising a radially outwardly projecting ledge on the upper end of the second valve mandrel portion, the radially outwardly projecting ledge adapted to abut the radially inwardly projecting ledge in the cylindrical housing defined by an annular end surface of the lower end of the third housing portion of the cylindrical housing when the valve mandrel is in the open position;

shear pin means for initially retaining the valve mandrel in the closed position within the cylindrical housing, the shear pin means releasably securing the first valve mandrel portion of the valve mandrel to the first housing portion of the cylindrical housing;

spring means for moving the valve mandrel to the open position upon the shearing of the shear pin means, the spring means being located between the shear pin means and the outwardly projecting ledge on the upper end of the second valve mandrel portion of the valve mandrel; and

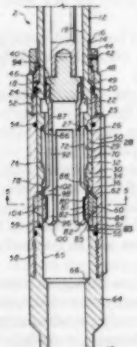
first and second seal means located between the second valve mandrel portion of the valve mandrel and the first housing portion of the cylindrical housing for sealing above and below the circulating port in the cylindrical housing when the valve mandrel is in the closed position, the first and second seal means having substantially identical diameters so that any longitudinal forces on the valve mandrel due to any external fluid pressure communicated to the valve mandrel through the circulating port in the cylindrical housing are balanced.

4,445,572

UNRESTRICTED BORE SAFETY JOINT

Douglas H. Fineberg, Tulsa, Okla., and Andrew Haynes, Missouri City, Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 17, 1981, Ser. No. 293,576
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—188 **32 Claims**



1. An apparatus incorporable on a conduit insertable into a subterranean well for severing said conduit at a predetermined location when subjected to a predetermined longitudinal load, said apparatus comprising:

first and second relatively telescoping members;

first connecting means for normally connecting said first to said second telescoping member and for disengaging and separating said first from said second telescoping members when subjected to said predetermined longitudinal load;

second connecting means for engaging said first telescoping member and laterally adjacently engaging said second telescoping member, said second connecting means being releasable and, when in an engaged position, retaining said first and said second telescoping members in an attached configuration when subjected to longitudinal loads in excess of said pre-determined longitudinal load, said second connecting means further comprising a member extending through a cooperating opening in said first telescoping member and engaging said second telescoping member on the exterior of said first telescoping member; and

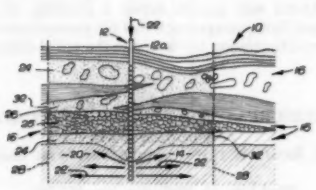
longitudinally shiftable means movable internally of said second connecting means and preventing inward movement of said second connecting means in a first position, and inwardly releasing said second connecting means when in a second longitudinally shifted position when said conduit is subjected to a longitudinal load in excess of said pre-determined force.

4,445,573

INSULATING FOAM STEAM STIMULATION METHOD

George E. McCaleb, Bakersfield, Calif., assignor to Thermal Specialties Inc., Bakersfield, Calif.

Filed Nov. 4, 1982, Ser. No. 439,126
Int. Cl.³ E21B *33/138, 43/24, 47/06*
U.S. Cl. 166—250 **18 Claims**



2. A method for recovering oil from a subterranean oil-bearing reservoir, utilizing a single well operated by steam stimulation, said reservoir having a permeable zone and an oil-bearing strata with a portion thereof to be stimulated by steam injection, which comprises:

(a) forming foam using a substantially non-condensible gas and a solution containing a sufficient amount of a surface active agent and a liquid, said formed foam being relatively stable, substantially non-condensible, thermally insulating and having said non-condensible gas as a gas phase,

(b) injecting said formed foam into said well until achieving a well bore injection pressure of said foam approaching a maximum stabilization injection pressure, but not exceeding the reservoir fracturing pressure, to position said foam in said permeable zone and substantially fill with said foam an expanse of said permeable zone which extends substantially radially from said well to the extent said permeable zone is in substantial proximity with said portion of said oil-bearing strata to be stimulated, to form a thermally insulating barrier to reduce loss of steam and heat from said oil-bearing strata to said permeable zone,

(c) injecting into said reservoir through said well after formation of said thermally insulating barrier a sufficient amount of steam to heat said portion of said oil-bearing strata to stimulate oil production therefrom, and

(d) withdrawing oil from said reservoir through said well.

4,445,574

CONTINUOUS BOREHOLE FORMED HORIZONTALLY THROUGH A HYDROCARBON PRODUCING FORMATION

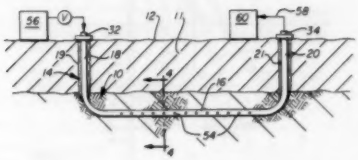
Roy R. Vann, Houston, Tex., assignor to GEO Vann, Inc., Houston, Tex.

Continuation of Ser. No. 132,765, Mar. 24, 1980, Pat. No. 4,334,580. This application Jun. 7, 1982, Ser. No. 385,834

The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.

Int. Cl.³ E21B *7/04, 43/24, 43/117, 43/119*

U.S. Cl. 166—268 **5 Claims**



1. Method of producing hydrocarbons from a pay zone, comprising

forming a borehole from an entry at the surface of the ground to the pay zone,

deviating the borehole to form a substantially horizontal portion in the pay zone,

further deviating the borehole until it exits at the surface of the ground,

pulling a casing through the borehole from the exit to the entry,

perforating the casing in the pay zone, and

producing hydrocarbons through the perforations.

4,445,575

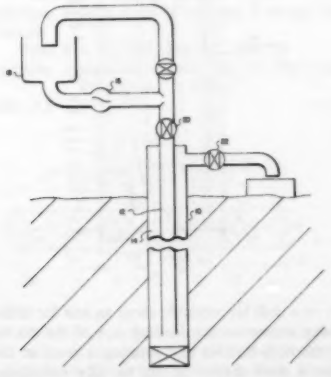
BOREHOLE CEMENTING OVER WATER

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 14, 1981, Ser. No. 330,061

Int. Cl.³ E21B *33/13*

U.S. Cl. 166—290 **3 Claims**



3. In a process of cementing a portion of a borehole where said borehole is filled, below the portion to be cemented, with drilling mud of lower density than the cement, the improvement comprising:

pumping a quantity of water-like fluid down an annulus between a casing in said borehole and the borehole wall, said quantity of water-like fluid being sufficient to fill at least about fifty feet of said annulus, and

pumping a quantity of cement down said annulus above said water-like fluid.

4,445,576

METHOD OF USING A SPACER FOR WELL CONTROL FLUID

Evelyn N. Drake, Plainfield, N.J., and Yuh-hwang Tsao, Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J. and Exxon Production Research Company, Houston, Tex.

Filed May 24, 1982, Ser. No. 381,226

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—291 **28 Claims**

1. A process for plugging an underground formation penetrated by a well which comprises using a displacing fluid to transport a shear thickening fluid to said formation, under conditions of relatively low shear, through a conduit extending into said well and then subjecting the shear thickening fluid to conditions of relatively high shear at that point of the formation desired to be plugged to form a paste which plugs said formation, wherein said shear thickening fluid comprises a water-in-oil emulsion having particles of hydratable, water-expandable clay dispersed in the continuous oily phase thereof, said oily phase having a surfactant dissolved therein and wherein said shear thickening fluid is both preceded and followed by a liquid spacer as it proceeds through said conduit, said spacer comprising a water-in-oil emulsion having a surfactant dissolved in the continuous oily phase thereof and having a viscosity less than the viscosity of the shear thickening fluid, but greater than that of the displacing fluid.

4,445,577

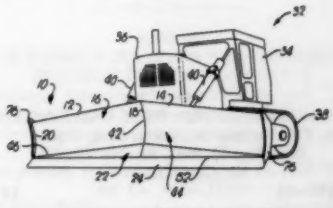
BULLDOZER BLADE

Dean E. Russell, and Tom H. Russell, both of Eureka, Kans., assignors to Russell & Sons Construction Co. Inc., Eureka, Kans.

Filed Dec. 21, 1981, Ser. No. 332,459

Int. Cl.³ E02F *3/80*

U.S. Cl. 172—701.3 **3 Claims**



1. A blade suitable for attachment to an earth-moving machine, said blade comprising:

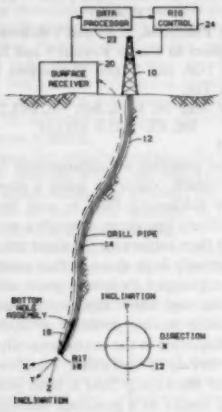
a pair of cross-sectionally arcuate blade portions joined together to form a common centerline and cooperatively defining a chevron-shaped load-bearing area, each of said portions presenting a concave earth-engaging forward face, said centerline being recessed in relation to the outermost lateral edges of said arcuate portions, the height of said blade at said centerline being greater than its height at said outermost lateral edges; and

a generally triangular plate secured to and depending from said load-bearing area, said plate including a lowermost generally horizontal edge.

4,445,578
SYSTEM FOR MEASURING DOWNHOLE DRILLING FORCES

Keith K. Millheim, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 15,998, Feb. 28, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,207
Int. Cl.³ E21B 7/06
U.S. Cl. 175—45 35 Claims



1. An apparatus connected to a drill string for use in drilling a borehole in the earth comprising:

a drill bit connected to said drill string;

a subunit connected to said drill string and said drill bit;

at least three circumferentially spaced means for measuring strain on said subunit to measure an indication of the force on said subunit perpendicular to its axis; and

means for processing the indications of force obtained by said means for measuring strain to obtain the sideforce on said drill bit.

4,445,579
PIPE CAROUSEL FOR WELL-DRILLING RIG

Paul Bello, 4756 Pullman St., Salem, Oreg. 97302

Filed Aug. 10, 1981, Ser. No. 291,669
Int. Cl.³ E21B 19/14
U.S. Cl. 175—52 13 Claims

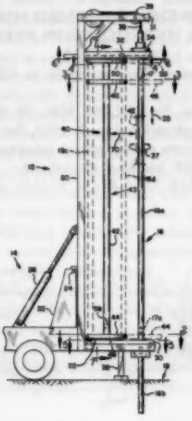
1. A well-drilling pipe carousel comprising:

a hollow central support tube having an opening extending lengthwise along one side thereof so as to provide the tube with a C-shaped cross section, the tube and opening being sized so that a section of drill pipe can be positioned in the tube;

support means for supporting the tube in a well-drilling mast for rotation about a vertical axis;

moving means for moving the support means and tube laterally relative to the drilling mast to envelop the uppermost pipe section of a drill string in nesting, substantially concentric relationship, the tube being rotationally positioned so as to admit the pipe section laterally through said opening;

pipe engaging means for engaging the pipe section against rotation inside the tube, and

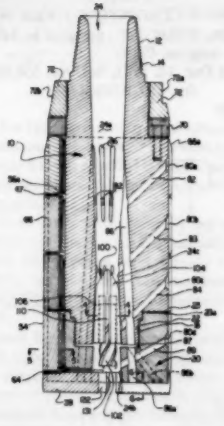


rotating means connected to the support means for rotating the tube about said vertical axis to unscrew said section from the drill string.

4,445,580
DEEP HOLE ROCK DRILL BIT

Lloyd W. Sahley, Mayfield Heights, Ohio, assignor to Syndrill Carbide Diamond Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 160,860, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 50,088, Jun. 19, 1979, abandoned. This application Jun. 30, 1982, Ser. No. 393,780
Int. Cl.³ E21B 10/04, 10/58
U.S. Cl. 175—404 55 Claims



41. A rock drill bit rotatable about an axis for drilling a hole comprising means on the leading end of the bit for drilling against the hole bottom and forming a core as the drilling proceeds, a core shaver having radially extending shaving edges for engaging said core mounted on the axis of said bit at the leading end thereof for shaving the top of the core on rotation of the bit, a central passage opening into the leading end face of the bit for delivering drilling mud to the bottom of the hole, said core shaver being mounted in said central pas-

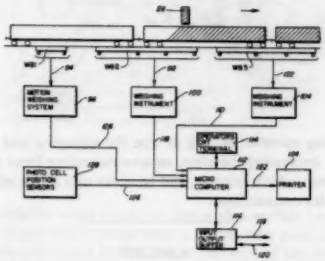
sage and projecting into an enlarged portion of said central passage for receiving the core, a collet chuck for receiving and holding said core shaver in said central passageway, the diameter of said central passage downstream of said chuck being smaller than the diameter of the downstream end of said collet chuck.

4,445,581

SYSTEM FOR LOADING RAILROAD CARS

Jack R. Caldicott, Barrington, Ill., assignor to Mangood Corporation, Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 415,164
Int. Cl.³ G01G *21/22, 19/52*
U.S. Cl. 177—163 **16 Claims**



1. A method of loading railroad cars coupled in motion, which comprises the steps of:

selecting a railroad car to be loaded;

prior to loading, obtaining the composite weight of the front truck of the selected railroad car and the rear truck of the adjacent railroad car forward of the selected railroad car;

prior to loading, obtaining the composite weight of the rear truck of the selected railroad car and the front truck of the adjacent railroad car behind the selected railroad car;

selecting a desired predetermined net weight of the load; and

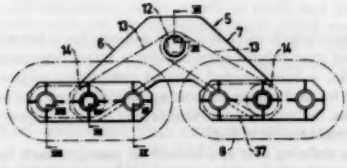
loading the selected railroad car in motion until a total composite weight is reached that is about equal to said composite weights plus said predetermined net weight of the load.

4,445,582

TRACK UNIT OF BOGIE TYPE

Albert Andersson, Frösön, Sweden, assignor to Skega AB, Ersmark, Sweden

Filed Feb. 16, 1982, Ser. No. 348,728
Claims priority, application Sweden, Feb. 17, 1981, 8101063
Int. Cl.³ B62D *55/00*
U.S. Cl. 180—9.5 **6 Claims**



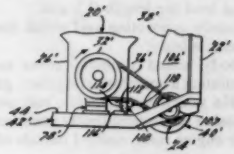
1. A track unit for an endless track driven vehicle having a driven axle, said unit comprising: a rocker arm freely pivoted between its ends on the driven axle; two track stands each including a frame, a forward track wheel and an aft track wheel rotatably mounted in said frame and an endless track supported on the track wheels, each track stand frame being freely pivotably mounted at a location between its respective track wheels on a track stand axle on one end of the rocker arm; and chain transmission means including a chain drive between said driven axle and said track stand axle and between said track stand axle and one wheel of the respective track wheel.

4,445,583

COOLING FAN CONTROL

Joseph S. Mazur, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 4, 1980, Ser. No. 183,890
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.³ B60H *01/24*
U.S. Cl. 180—68.1 **11 Claims**



1. In a vehicle of the type including a frame, an engine having a crankshaft mounted therein for rotation about an axis, means mounting the engine on the frame such that the engine and crankshaft rock transverse to the crankshaft axis in response to varying engine load, and an engine cooling fan having an input shaft defining an axis about which the fan rotates, the improvement comprising:

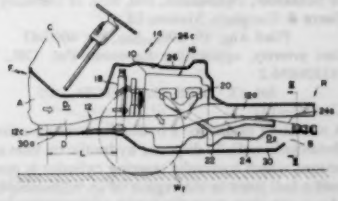
means mounting the fan with the fan axis laterally spaced from and substantially parallel to the crankshaft axis and fixed against movement relative to the frame, whereby the spaced apart distance between the fan and crankshaft axes varies in response to varying engine load; and drive means connecting the input shaft with the crankshaft, said drive means including first and second drive pulleys respectively rotatable about the crankshaft and input shaft axes and moveable relative to each other when said spaced apart distance between the input shaft and crankshaft axes varies, a single drive belt drivingly interconnecting the pulleys, and tensioning means for maintaining a relatively constant tension on said belt as said spaced apart distance varies.

4,445,584

MOTOR VEHICLE EQUIPPED WITH ENGINE NOISE EMISSION PREVENTING DEVICE

Akira Kimura, Kawasaki; Masao Ishihama, and Yoshikazu Hayakawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 8, 1981, Ser. No. 300,061
Claims priority, application Japan, Apr. 12, 1978, 53-42074
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—69.22 **15 Claims**



1. A motor vehicle, comprising:

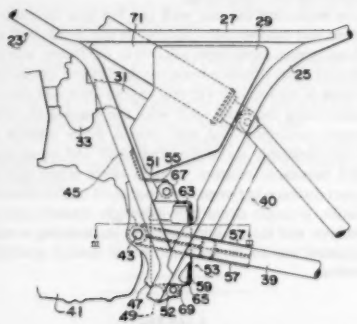
a vehicle body including lower opposite side wall sections;
a power unit elastically supported by the vehicle body and including an internal combustion engine;
a radiator fluidly connected to said engine;
a transmission mechanically connected to said engine;
said radiator positioned between said lower opposite wall sections so as to be generally vertical;
a sound insulating cover located below said power unit and extending away from said radiator in the vehicle forward direction by a length (L) not less than the distance $(b')/\pi$, where (b') is the distance between said lower opposite side wall sections of said vehicle body in the direction of the width of said radiator, said sound insulating cover further extending away from said radiator in the vehicle rearward direction at least to the rearward end of said transmission, said radiator positioned rearwardly from the front of said vehicle by at least the length (L); and
means for securely connecting said sound insulating cover with said vehicle body;
said vehicle body, sound insulating cover and connecting means constituting a noise insulating duct, generally longitudinal within which said radiator, said power unit and said transmission are longitudinally positioned in series so as to reduce engine noise emitted outside of the vehicle.

4,445,585

MOTORCYCLE CONFIGURATION

Yuichi Imani, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 24, 1982, Ser. No. 423,027
Int. Cl.³ B62D *25/00*
U.S. Cl. 180—68.5 **6 Claims**



1. A motorcycle of the type in which an engine having a crankcase is supported on a body frame, a pair of rear arm members is hinged to said body frame, and in which a battery is supported on said body frame, the improvement comprising: said battery being disposed and mounted in the vicinity of the back of said crankcase between said pair of rear arm members.

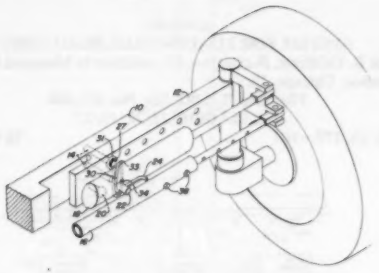
4,445,586

MOUNTING MEANS FOR A STEERING CYLINDER

Werner Schneider, Deidesheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Aug. 19, 1982, Ser. No. 409,387
Claims priority, application European Pat. Off., Aug. 27, 1981, 81106656.2
Int. Cl.³ B60B *35/10*; B62D *5/06*
U.S. Cl. 180—132 **4 Claims**

1. A mounting means for a hydraulic steering cylinder having substantially radially disposed hydraulic oil inlet and outlet connections which hydraulic steering cylinder is mounted by means of a ball joint in the region of an adjustable-track half axle of an agricultural machine, and extends substantially between and substantially parallel to the half axle and a track rod which is also adjustable in track, the hydraulic steering cylinder acting on a steering arm associated with an end of the axle, the mounting means comprising:
an anchoring member fixed in a bore provided in the adjustable-track half axle and projecting therefrom; and



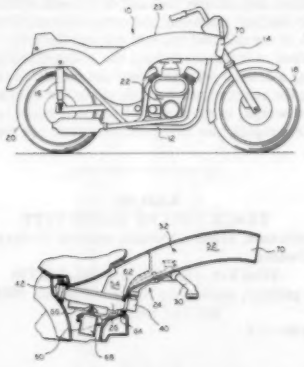
a spring member having an eye for engaging and receiving the anchoring member, an arm extending from the eye to a loop which engages and receives one of the oil inlet and outlet connections.

4,445,587

MOTORCYCLE COOLING SYSTEM

Michael J. Hillman, Fox Point, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Dec. 16, 1981, Ser. No. 331,132
Int. Cl.³ B62D *61/02*; B60K *11/04*
U.S. Cl. 180—229 **13 Claims**



1. A motorcycle including front and rear forks for mounting front and rear wheels respectively, a frame interconnecting said forks, a liquid cooled internal combustion engine and a radiator for said engine supporting on said frame and between said forks, the improvement comprising an air transport system for said radiator including:
means defining first and second air passages each having a forwardly facing inlet opening disposed respectively on the opposite sides of said front fork,
each air passage means extending rearwardly from its inlet,
means defining a plenum chamber disposed adjacent said radiator,
said air passages having an outlet opening into said plenum chamber,
the cross sectional area of each passage increasing gradually between its inlet and outlet ends,
an exhaust duct connected to said plenum chamber,

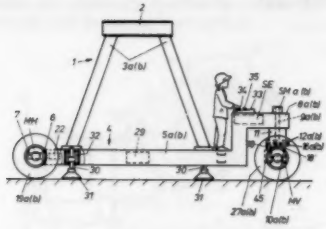
said radiator being disposed between said plenum chamber and said exhaust duct and creating a substantial resistance to air flow therebetween.

4,445,588

GUIDABLE BOGIE TRUCK FOR MOBILE CRANES

Thomas Truninger, Zurich, Switzerland, assignor to Adna AG, Vaduz, Liechtenstein

Filed Jun. 4, 1982, Ser. No. 385,118
Int. Cl.³ B60K *17/14, 41/28*
U.S. Cl. 180—233 **11 Claims**



1. A guidable bogie truck for use with a mobile crane, said guidable bogie truck comprising a frame; two pairs of wheel means, one pair being connected to one end of the frame and the second pair being connected to the opposite end of the frame, one of said two pairs of wheel means being respectively connected to pivotable wheel axles so as to enable this pair of wheel means to constitute guide wheel means; four support legs movably connected to the frame, each support leg being attached to the frame near a respective wheel means and each support leg including a footplate; lifting means connected to each of said four support legs so as to extend them towards the ground and enable their associated footplates to contact the ground or retract them upwardly towards the frame; at least one wheel drive means for turning said wheel means; at least one adjustment motor means connected to said pivotable wheel axles to cause them to pivot and thus the associated guide wheel means to turn, thereby steering the bogie truck; and a common control device to which each of said wheel drive means, each adjustment motor means and each lifting means is connected, said common control device including at least one shift element for controlling said wheel drive means and at least one direction-setting element for selecting the pivot position of said pivotable wheel axles, said common control device being constructed in such a manner that whenever the direction-setting element is actuated, it first guides at least the two support legs located nearest said pivotable wheel axles into an extended position by their associated lifting means such that the footplates thereof contact the ground and cause the guide wheels to be lifted away from the ground, then it causes said adjustment motor means to pivot said pivotable wheel axles such that the associated guide wheel means are aimed in the desired new direction of travel, and it then causes said adjustment motor means to discontinue operation.

4,445,589

WINDOW ASSEMBLY INCLUDING A STORABLE FIRE ESCAPE

Bruce A. Longenecker, 4034 Newport Ave., Omaha, Nebr. 68112

Filed May 4, 1983, Ser. No. 491,601
Int. Cl.³ E06C *9/14*
U.S. Cl. 182—76 **5 Claims**

1. In combination with a building including an outside wall, comprising,

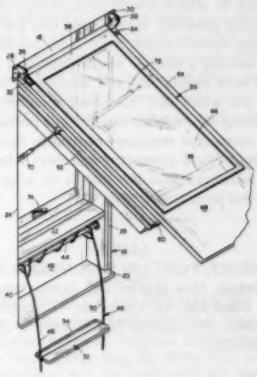
a vertically disposed rectangular first frame means mounted in the wall of the building including upper intermediate, lower and opposite side frame portions,

said intermediate, lower and side frame members defining a storage compartment therebetween having an open outer end,

a vertically disposed window support frame means positioned within said first frame means including upper, lower and opposite side frame portions,

said window support frame means being pivotally secured to said first frame means whereby said window support frame means may be pivotally moved outwardly relative to the building wall and said first frame means,

said window support frame means being pivotally movable between closed and escape positions relative to said building wall and said first frame means,



a window means mounted in said window support frame means,

a panel means provided on said window support frame means extending downwardly from the lower end of said window means which covers the open outer end of said storage compartment when said window support frame means is in its closed position,

a foldable escape ladder stored within said storage compartment which may be lowered towards the ground when said window support frame means is moved to its escape position,

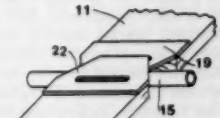
and releasable locking means normally maintaining said window support frame means in its closed position.

4,445,590

SCAFFOLD PLANK CONNECTING ARRANGEMENT

Carl-Bertil Ihrman, Jönköping, Sweden, assignor to Floby Durk, Floby, Sweden

Filed Mar. 26, 1982, Ser. No. 362,052
Claims priority, application Sweden, Mar. 30, 1981, 8102009
Int. Cl.³ E04G *5/08, 7/20*
U.S. Cl. 182—222 **12 Claims**



1. A scaffold plank connection arrangement comprising:

a pair of substantially identical connector members, each member for attachment to the end of a scaffold plank;

each connector member comprising: a plate with opposed longitudinal edges having a flat portion disposed in a first plane; a flat tongue portion integrally formed with said plate portion and sharing a common edge therewith, said tongue portion disposed in a second plane substantially perpendicular to said first plane; and an elongated slit being centrally located with respect to said flat portion and extending in said flat plate portion in a dimension parallel to said second plane, said slit being spaced from said common edge and extending parallel to, and substantially co-extensively, with said common edge; and

in use said first plane being substantially horizontal, and the width of said flat plate portion corresponding to the width of a plank to which it is to be attached, with said second plane being generally vertical and said flat tongue portion extending downwardly from said common edge; said tongue having a smaller width than, and being centrally located with respect to, said horizontal plate portion so that in use when said connector members are placed in overlapping relationship said tongue portion of the upper of said connector members protrudes through the slit of the lower of said connector members whereby said connector members, and the planks to which they are attached, are inter-connected.

4,445,591

LIGHTWEIGHT, PORTABLE HUNTER'S TREE STAND

Paul M. Mitchell, 1044 Marine Dr., Bellingham, Wash. 98225

Filed Jan. 13, 1983, Ser. No. 457,573

Int. Cl.[3] **E04G** *5/08;* **A01M** *31/02;* **A45F** *3/26;* **A47C** *9/10*

U.S. Cl. 182—222 **8 Claims**

1. A lightweight, portable hunter's tree stand comprising, in combination:

(a) a rigid planar seat member having opposed ends;

(b) first and second V-shaped notches formed in respective ones of said opposed ends of said planar seat member for mounting in partially surrounding face-to-face engagement with the facing sides of a pair of diverging tree branches;

(c) means secured to said planar seat member and defining a sharp knife-like edge projecting laterally beyond the edge of said first V-shaped notch formed in one end of said seat member for biting engagement with one of the pair of divergent tree branches for securely holding one end of said tree stand in stable engagement therewith;

(d) laterally extending bracket defining means releasably secured to said planar seat member adjacent said second V-shaped notch with freedom for movement into engagement with the other of the pair of divergent tree branches;

(e) first means for releasably locking said bracket defining means to said planar seat member in any desired preselected position where one portion of said bracket defining means is in generally face-to-face relation with the other of the pair of divergent tree branches; and,

(f) second means extending through said bracket defining means for fixedly securing said seat member to the other of the pair of divergent tree branches so that said planar seat member is securely and stably fixed in position between the divergent tree branches and capable of supporting the weight of a hunter thereon.

4,445,592

LUBRICATION SYSTEM

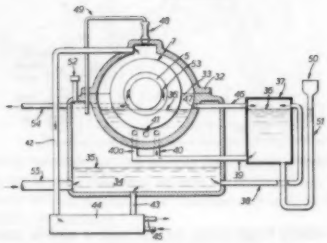
Nigel H. New, Harrow, and John B. O'Rourke, Uxbridge, both of England, assignors to The Glacier Metal Company, Limited, Middlesex, England

Filed Jul. 2, 1981, Ser. No. 279,799

Claims priority, application United Kingdom, Jul. 3, 1980, 8021803

Int. Cl.[3] **F16N** *7/40*

U.S. Cl. 184—6.13 **11 Claims**



1. A lubrication system for supplying a liquid lubricant to at least one bearing, said system comprising:

(a) a casing;

(b) a thrust collar located within said casing;

(c) a viscosity pump freely supported on said thrust collar and having an inlet and an outlet;

(d) a main sump which serves as a main lubricant reservoir; and

(e) a closed auxiliary reservoir which serves as a priming reservoir for said viscosity pump,

wherein:

(f) the outlet of said pump is arranged to supply lubricant to said at least one bearing;

(g) the inlet of said pump is connected to said closed auxiliary reservoir at a first level;

(h) said closed auxiliary reservoir is in communication with said casing at a second level such that the level of the lubricant in said closed auxiliary reservoir and the level of the lubricant in said casing are the same when said viscosity pump is not in operation, said level of the lubricant being such that a substantial portion of said thrust collar is immersed in the lubricant;

(i) said main sump is in communication with said closed auxiliary reservoir at a level at or above said second level;

(j) said main sump is in communication with said casing at a level above said second level; and

(k) the free surface of the lubricant in said main sump is at a third level which is below said second level.

4,445,593

FLAT TYPE FEEDER CABLE

John D. Coleman; Donald L. Obst, and Heinrich A. Kraft, all of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Oct. 15, 1982, Ser. No. 434,507

Int. Cl.[3] **H01B** *7/08;* **B66B** *9/00*

U.S. Cl. 187—1 R **10 Claims**

1. A flat type feeder cable useful for transmitting electrical energy from a stationary source to a moving apparatus comprising:

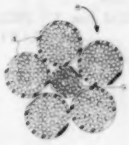
(a) a plurality of spaced apart strength members each with their respective axes arranged in a line and in substantially coplanar relationship with one another;

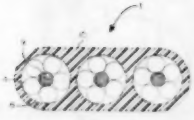
(b) a plurality of strand members stranded together about

each of said strength members to form a core, said strand members comprising a plurality of electrical conductors circumscribed by a sheath and forming first and second alternatingly repeating, substantially equal length, first and second sections, each of said first sections having a common direction and degree of lay and each of said second sections also having a common direction and degree of lay substantially equal to but opposite to that of the first sections; and

(c) a jacket of flexible material circumscribing said core members.

6. An elevator system comprising a car, a feeder cable and a stationary terminating means, the feeder cable connected to the car and said stationary terminating means, the improvement wherein said feeder cable comprises:





(a) a plurality of spaced apart strength members each with their respective axes arranged in a line and in substantially coplanar relationship with one another;

(b) a plurality of strand members stranded together about each of said strength members to form a core, said strand members comprising a plurality of electrical conductors circumscribed by a sheath and forming first and second alternatingly repeating, substantially equal length, first and second sections, each of said first sections having a common direction and degree of lay and each of said second sections also having a common direction and degree of lay substantially equal to but opposite to that of the first sections; and

(c) a jacket of flexible material circumscribing said core members.

4,445,594

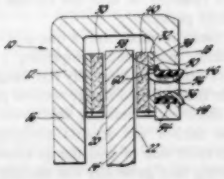
DISC BRAKE NOISE REDUCTION

Charles T. Hoffman, Jr., Waynesville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1981, Ser. No. 316,636

Int. Cl.³ F16D 65/02

U.S. Cl. 188—73.37 **2 Claims**



1. In a disc brake caliper assembly, a noise reduction arrangement comprising:

a caliper leg for mounting a brake pad assembly on one side of a disc to be braked, said leg having a plurality of spaced openings each having an arcuately extending enlarged shoulder recess opening toward the disc;

a brake pad assembly including a brake shoe having a plurality of clench tabs formed thereon in matching relation with said plurality of spaced openings;

a plurality of rubber-like grommets respectively received in said openings, each of said grommets having a cylindrical body received through an opening and an arcuately extending flange head fitting in and occupying said arcuately extending shoulder recess and engaging said brake shoe so as to retain each grommet in its opening;

said shoe clench tabs extending through said openings and said grommets so that said grommet flange heads are axially trapped in said recesses between said leg and said shoe to assure axial and rotational retention of said grommets, said clench tabs being clenched tightly on said grommets and said leg to retain said brake pad assembly tightly on said leg, said grommets only providing a noise dampening action during braking to reduce brake noise.

4,445,595

DISC BRAKE PAD ASSEMBLIES

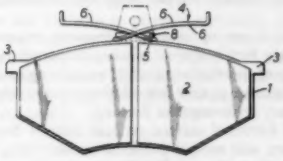
Heinz W. Baum, Saarbrucken Dudweiler, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 71,497, Aug. 31, 1979, Pat. No. 4,290,508. This application Jun. 29, 1981, Ser. No. 278,472

Claims priority, application United Kingdom, Sep. 14, 1978, 36802/78; Nov. 27, 1978, 46110/78

Int. Cl.³ F16D 65/00

U.S. Cl. 188—73.38 **4 Claims**



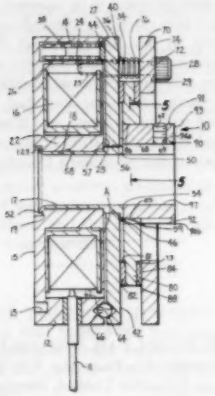
1. A friction pad assembly comprising: a flat unitary backing plate having front and rear faces, a top edge, and two lateral edges; a projection integral with and extending upwardly from the top edge of the backing plate and in the plane thereof which projection has front and rear faces, and lateral edges, and is formed with laterally facing undercuts in the lateral edges and extending from face to face of said projection; an anti-rattle spring having a bent portion wrapped around the projection and seated in and extending directly between the undercuts to retain the anti-rattle spring in position on the projection and at least one arm portion integral with the bent portion and extending from the bent portion away from said top edge and towards one said lateral edge and terminating in a free end laterally spaced from said projection; and friction material secured to the front face of the backing plate and terminating below the level of the projection; the vertical extent of said projection above the said top edge being the minimum required to provide undercuts of a size to retain the anti-rattle spring in position against accidental displacement while at all times enabling said bent portion of said spring seated in said undercuts to be moved laterally into and out of said undercuts when said spring is applied to or removed from said projection.

4,445,596

ELECTROMAGNETICALLY RELEASED SPRING APPLIED FRICTION BRAKE WITH TORQUE BOOSTER AND DRIVING FORCE DISTRIBUTOR

Paul E. Waters, Montecito, Calif.; David S. Vaughan, Erin, and Carmen J. Mustico, Jr., Elmira Heights, both of N.Y., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Sep. 8, 1981, Ser. No. 300,342
Int. Cl.³ B60T *13/74*; H02K *7/102*
U.S. Cl. 188—171 **17 Claims**



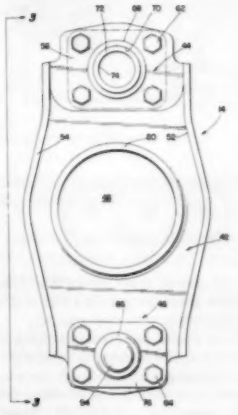
1. A friction braking device comprising:
an annular rotatable member to be braked;
a first frictional surface on said annular rotatable member;
a stationary ferromagnetic housing mounted adjacent to said annular rotatable member;
an annular ferromagnetic armature interposed said annular rotatable member and said stationary ferromagnetic housing;
means for mounting said ferromagnetic armature to said stationary ferromagnetic housing to permit relative axial movement therebetween while restraining said ferromagnetic armature against free relative rotation relative to said stationary ferromagnetic housing;
a second frictional surface on said annular ferromagnetic armature, said second frictional surface being selectively engageable with said first frictional surface to generate therebetween a frictional braking force;
first biasing means, interposed said annular ferromagnetic armature and said stationary ferromagnetic housing, for generating a first predetermined biasing force biasing said annular ferromagnetic armature axially away from said stationary ferromagnetic housing and, thereby, biasing said second frictional surface into engagement with said first frictional surface;
electromagnetic means, mounted in said stationary ferromagnetic housing and selectively energized to generate a second predetermined biasing force larger than said first predetermined biasing force, said second predetermined biasing force being larger than and in the opposite direction from said first predetermined biasing force such that, upon energization of said electromagnetic means, said annular ferromagnetic armature moves axially towards said stationary ferromagnetic housing and disengages said first and second frictional surfaces;
torque booster means comprising non-self-energizing camming means reacting to the torque reaction generated by the engagement of said first and second frictional surfaces to supplement the axial engagement force of said first biasing means on said ferromagnetic armature only when said electromagnetic means is de-energized, whereby the axial engagement force provided by said torque booster means increases the torque capacity of said friction braking device;
a hub member mounted concentrically with said annular rotatable member;
a plurality of slots contiguous with the inner diameter of said annular rotatable member; and
a plurality of radial bosses on the periphery of said hub member, said plurality of bosses engaging said plurality of slots such that said hub member drives said annular rotatable member through said slots and said bosses.

4,445,597

SPIDER ASSEMBLY FOR DRUM BRAKE

Gunnar Baltare, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 17, 1982, Ser. No. 389,526
Int. Cl.³ F16D *65/09*
U.S. Cl. 188—206 A **6 Claims**



1. An improved spider-anchor pin assembly for a drum brake of the type having a spider mountable to an axle housing, a pair of generally arcuate brake shoes each having a pair of radially inwardly extending generally parallel webs straddling said spider and pivotably supported on anchor pin means fixed to the spider, and means to selectively pivot said brake shoes radially outwardly on said anchor pin means into frictional contact with a brake drum, said improved spider-anchor pin assembly comprising:
a stamped metallic spider body mountable to an axle housing, said spider body provided with a first through bore located generally at the pivot axis of said brake shoes, said spider body defining a generally flat surface extending generally normally to the axis of said first through bore and surrounding said first through aperture, a plurality of second bores opening on said flat surface and defining a given bolt hole pattern,
an anchor pin piece formed from a one-piece metallic forging, said anchor pin piece comprising a generally flat flange section defining a generally flat flange surface on at least one side thereof, said flange section provided with a plurality of third bores defining said given bolt hole pattern, and an anchor pin section extending axally outwardly from each side of said flange section, said flange surface abutting said generally flat surface with said second and that third bores in alignment and one of said anchor pin sections extending through and beyond said first through bore; and
an externally threaded fastener extending through each of said aligned second and third bores and threadably receiv-

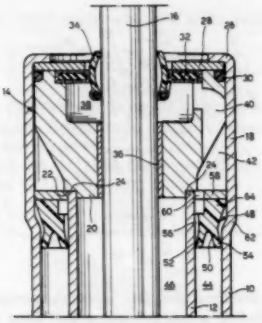
ing a nut on the free ends thereof to removably attach said anchor pin piece to said spider body.

4,445,598

TWO-TUBE TELESCOPIC HYDRAULIC SHOCK ABSORBERS

Guido Brambilla, Turin, Italy, assignor to Societa Impianti Elettrici Telefonici Telegrafici e Costruzioni Edili S.p.A., Italy

Filed May 7, 1982, Ser. No. 376,166
Claims priority, application Italy, May 8, 1981, 67627 A/81
Int. Cl.³ F16F 9/06
U.S. Cl. 188—322.16 **8 Claims**



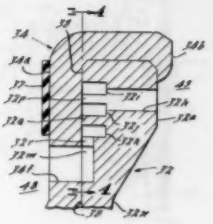
1. A two-tube hydraulic shock absorber comprising coaxial inner and outer tubes or cylinders which define an interspace therebetween, wherein a piston is slidable in the inner cylinder and includes a rod which projects from an upper end of the shock absorber through an annular head common to both cylinders, the head having an annular radial lower shoulder which engages axially a rim at the upper end of the inner cylinder, wherein the head includes a bushing in which the rod is slidable and the head is formed with an annular reservoir overlying the bushing for receiving hydraulic fluid which is drawn between the rod and the bushing from the chamber of the internal cylinder, radial passages interconnecting the reservoir and the upper part of the interspace, and wherein the interspace contains gas under pressure, one-way sealing means being provided to prevent the gas under pressure from reaching the passages and at the same time to allow oil to descend into the interspace through the passages, wherein said sealing means comprises an annular gasket (**48**; **148**; **248**) of elastomeric or similar material which has an inverted U- or V-shaped cross section and is arranged in the upper part of the interspace (**44**) so as to form a channel (**50**) which opens downwardly and is defined by two annular lips (**52**, **54**; **252**, **254**) engaged with the inner cylinder (**12**) and the outer cylinder (**10**) respectively, one (**52**; **252**) of which deforms elastically to separate from the respective cylinder and enable the oil to descend into the interspace (**44**), the deformable lip (**52**; **252**) engaging the respective cylinder in an annular zone below the rim at the upper end (**24**) of the inner cylinder (**12**), wherein the deformable lip (**52**; **252**) has an external face with a longitudinal profile which diverges upwardly relative to the respective cylinder so as to define, between the lip and the cylinder, an annular passage (**56**; **256**) normally closed at its lower end by the contact between the lip and the cylinder, wherein an upper reinforcing washer (**58**; **158**; **258**) is connected to the gasket (**48**; **148**; **248**), wherein the radial shoulder (**22**) of the head (**14**) projects radially outwards relative to the inner cylinder (**12**), wherein the washer has a radially internal flat annular edge which engages the projecting part of the shoulder (**22**), and wherein said washer includes at least one notch which exposes at least a part of the upper mouth of said annular passage (**56**; **256**).

4,445,599

COOLING MEANS FOR TORQUE CONVERTER BYPASS

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 27, 1981, Ser. No. 315,567
Int. Cl.³ F16D 13/72
U.S. Cl. 192—3.29 **19 Claims**



1. An apparatus comprising:

A. A housing for containing a liquid;

B. Means defining a partition dividing said housing into first and second liquid chambers sealed from each other by said partition, said partition having a generally planar configuration and including a first surface area on one side thereof in wetting juxtaposition to the liquid in said first liquid chamber and a second surface area on the other side thereof in wetting juxtaposition to the liquid in said second liquid chamber;

C. Means defining a single entrance opening in said first surface area and a single exit opening in said second surface area, and

D. Means defining a plurality of elongated narrow passages each extending circuitously through said partition between said single entrance opening and said single exit opening, each of said passages having an effective length at least several times greater than the effective distance between said surfaces to provide a plurality of long and narrow but large surface area flow paths between said chambers to provide a rate of liquid flow through said passages between said chambers that varies significantly with variations in the viscosity and thereby the temperature of the liquid.

4,445,600

SELF ADJUSTING RELEASE MECHANISM FOR CLUTCH

Frederick C. Schmidt, Syracuse, N.Y., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

Filed May 15, 1981, Ser. No. 264,073
Int. Cl.³ F16D 13/75, 13/54
U.S. Cl. 192—18 R **11 Claims**

1. A self adjusting clutch release mechanism that includes

a sleeve slidably mounted upon a drive shaft behind a clutch disc,

a spider threaded upon the front end of the sleeve for receiving therein biased clutch release arms that operatively connect the spider to the clutch to urge the sleeve into a full forward position when the clutch disc is engaged,

a release bearing housing secured to the back of the sleeve for movement therewith,

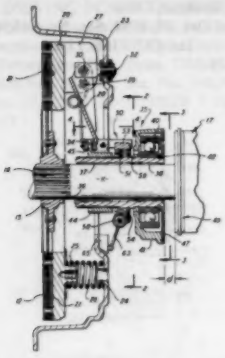
a clutch brake mounted upon the shaft behind the housing,

actuating means for moving the release bearing housing rearwardly a first distance whereby the release arms disengage the clutch disc and a second greater distance whereby the housing engages the clutch brake,

sensing means for sensing the full forward position of the sleeve and thereby detecting clutch disc wear, and

a worm gear secured to the sleeve and a worm in meshing engagement with the gear that is connected to said sensing

means for advancing the spider upon the threaded end of the sleeve to compensate for clutch wear whereby the



travel distance between the housing and the clutch brake remains relatively constant.

4,445,601

VEHICLE HAVING A MAIN CLUTCH AND AN AUXILIARY CONTROLLABLE CLUTCH

Peter Hofbauer; Paulus Heidemeyer, and Romanus Scholz, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

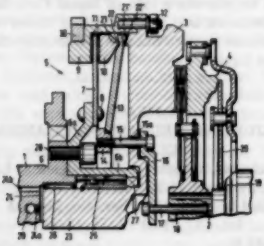
Division of Ser. No. 45,757, Jun. 5, 1979, Pat. No. 4,366,887. This application Mar. 1, 1982, Ser. No. 353,478

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 2824730

The portion of the term of this patent subsequent to Jan. 4, 1999, has been disclaimed.

Int. Cl.[3] **F16D** *13/44, 25/08*

U.S. Cl. 192—48.8 **7 Claims**



1. A clutch arrangement for a motor vehicle having an internal combustion engine for driving said vehicle comprising a flywheel means interposed between a drive tansmission of said vehicle and said engine for equalizing the non-uniformity of the engine output torque and providing a driving connection between the engine and the transmission, a main clutch means arranged between said flywheel means and said transmission for providing a driving connection therebetween when engaged and for interrupting said driving connection for shifting gears when disengaged, and an auxiliary controllable clutch means, arranged between said engine and said flywheel means, for providing a driving connection therebetween when engaged and for automatically disengaging and interrupting said driving connection between the flywheel means and the engine at predetermined operating states of said vehicle, wherein said controllable clutch means comprises a disc clutch means for producing engagement free from rotational play between said engine and said flywheel means, when said disc clutch means are engaged, and wherein the direction of force for actuating said main clutch for interrupting said driving connection is opposed to the direction of force for actuating said controllable clutch.

4,445,602

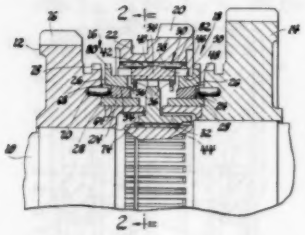
GEAR SYNCHRONIZER FOR A POWER TRANSMISSION

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1981, Ser. No. 323,415

Int. Cl.[3] **F16D** *13/28;* **F16H** *3/38*

U.S. Cl. 192—53 F **3 Claims**



2. A synchronizer and gear assembly comprising; a gear member including a hub portion; a split cone ring rotatable with said gear member and having an outer conical surface, an inner cylindrical surface, and an axially extending slot permitting radial contraction of the split cone ring when a radial force is applied to the conical surface; a synchronizer ring having a conical surface disposed for controlled abutment with said split cone ring conical surface; a split bearing ring rotatably supporting said split cone ring, journalled on said hub portion and being rotatable with said synchronizer ring, including an axial split permitting radial contraction in the presence of a radial force imposed by contraction of said split cone ring; and means for moving said synchronizer ring axially relative to said split cone ring and said split bearing ring for providing controlled abutment of said conical surfaces for transmitting a synchronizing radial force to said split cone ring for inducing an accelerating synchronizing torque at said gear member, said radial force being communicated to said split cone ring and said split bearing ring to impose accelerating synchronizing torques on said gear member at the abutment of said synchronizer ring and said split cone ring and at the bearing surfaces between said split cone ring and said split bearing ring and between said split bearing ring and said hub portion whereby the synchronizing torque is increased for a given synchronizer force.

4,445,603

SAFETY CIRCUIT FOR AN ELECTRONIC THROTTLE CONTROL OF INTERNAL COMBUSTION ENGINES

Reinhard Filsinger, Wernau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,948

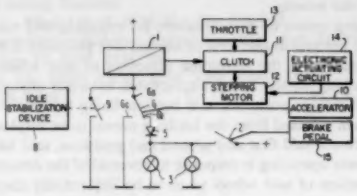
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3034424

Int. Cl.[3] **B60K** *41/28*

U.S. Cl. 192—0.055 **12 Claims**

1. A safety circuit for an electronic throttle control for internal combustion engines in motor vehicles having a brake pedal means, an accelertor means, a stepping motor, electronic means for controlling the stepping motor, a throttle means actuated by the stepping motor, and a clutch means interposed between the stepping motor and throttle means, characterized in that the safety circuit includes means for engaging the clutch means when the accelerator means and brake pedal means are

not actuated simultaneously and when the accelerator means is actuated alone or together with the brake pedal means and for



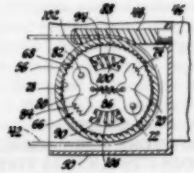
disengaging the clutch means when the brake pedal means is actuated alone.

4,445,604

CLUTCH DRIVE FOR POWER BELT SYSTEM

Lloyd W. Rogers, Jr., Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1982, Ser. No. 348,916
Int. Cl.³ F16D *43/16*; B60R *21/10*
U.S. Cl. 192—71 **3 Claims**



1. In combination with a motor vehicle passive occupant restraint belt system having a belt carriage movable along a track by a motor-driven drive element to move the belt between an occupant restraint position and a stowed position permitting occupant ingress and egress, a motor drive mechanism for driving the drive element comprising:

an electric motor;

a drive gear coupled with the drive element for driving the drive element in one direction to move the belt to the restraint position and in the other direction to move the belt to the stowed position;

and clutch means acting between the electric motor and the drive gear, said clutch means acting to couple the electric motor with the drive gear only when the electric motor is energized whereby when the electric motor is not energized the occupant may manually grip the belt carriage to effect manual movement of the belt carriage and the drive element and the drive gear to move the restraint belt between the occupant restraint and the stowed positions in the event of failure to energize the electric motor.

4,445,605

SPRING ENGAGED FLUID RELEASED FAN CLUTCH FOR A LIVE SHAFT

Hugh K. Schilling, St. Paul, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Continuation of Ser. No. 180,846, Aug. 25, 1980, Pat. No. 4,355,710. This application Sep. 29, 1982, Ser. No. 426,591
Int. Cl.³ F16D *13/44, 25/063*
U.S. Cl. 192—91 A **14 Claims**

1. Apparatus for rotatably relating a first member and a second member comprising, in combination: means for rotatably mounting the first member with respect to the second member, with the first member including a friction disc; a disc-like cylinder plate having a perimeter; means for connecting the cylinder plate to the second member; means for rotatably mounting the cylinder plate to the friction disc of the first member; an annular piston having an axial hole, with the axial hole of the annular piston being slideably mounted on the connecting means, with the piston being reciprocal between the second member and the disc-like cylinder plate, with a piston chamber being defined between the disc-like cylinder

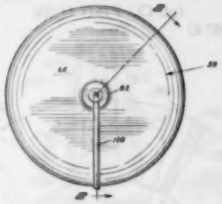


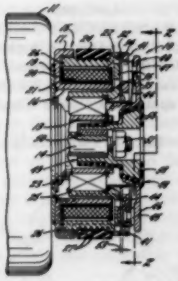
plate and the annular piston; friction facing operatively attached to the piston for engagement contact with the friction disc for rotatably relating the first and second members; means for introducing air pressure into the piston chamber for separating the disc-like cylinder plate and the annular piston; and means for biasing the annular piston towards the disc-like cylinder plate.

4,445,606

ARMATURE ASSEMBLY FOR ELECTROMAGNETIC COUPLING

Kalvin G. Van Laningham, Rockton, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Dec. 14, 1981, Ser. No. 330,610
Int. Cl.³ F16D *47/02, 27/00*
U.S. Cl. 192—106.1 **9 Claims**



1. An armature assembly for an electromagnetic coupling, said assembly comprising a forwardly disposed mounting plate and a rearwardly disposed armature, means connecting said armature and said plate for rotation in unison while permitting said armature to move toward and away from said plate, a hole extending axially through said plate, the periphery of said hole being defined by a first set of circumferentially spaced teeth and by a first set of circumferentially spaced valleys which alternate with the teeth, a hub having a second set of circumferentially spaced teeth and having a second set of circumferentially spaced valleys which alternate with the second teeth, said hub being telescoped into said hole with the teeth of each set being disposed within the valleys of the other set, elastomeric material disposed between said first and second teeth and coupling said plate and said hub for rotation in unison, the tips of the teeth of one of said sets and the bottoms of the valleys of the other of said sets being shaped so as to be engageable with

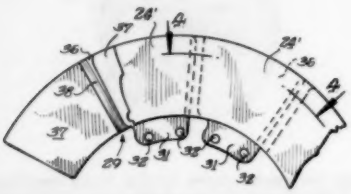
one another with a wedging action upon forward shifting of said plate relative to said hub thereby to captivate said plate against forward separation from said hub.

4,445,607

CLUTCH DRIVEN PLATE ASSEMBLY

Kerry G. Knight, Washington, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 2, 1981, Ser. No. 326,787
Int. Cl.³ F16D *13/64*
U.S. Cl. 192—107 C **4 Claims**



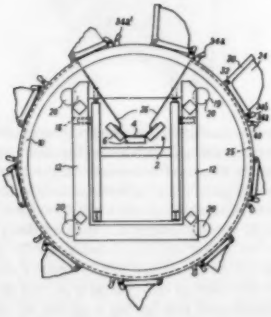
1. A clutch driven plate assembly including a hub, a clutch plate and a pair of annular friction facings carried by the clutch plate, the improvement comprising a plurality of cushion springs secured to the clutch plate adjacent the periphery thereof, each cushion spring including an inwardly extending anchoring portion and a body portion formed by a pair of offset flat areas joined by an intermediate offset portion, the anchoring portion of each cushion spring being generally radially aligned with one flat area of the body portion and the offset flat area trailing said one flat area, said offset area of each cushion spring substantially completely overlapping the opposite flat area of the next adjacent cushion spring, each friction facing being adhesively joined to substantially the entire surface extent of one flat area of each cushion spring.

4,445,608

BUCKET WHEELS AND BUCKET WHEEL RECLAIMERS

David A. Evans, and Paul J. Dowden, both of Bristol, England, assignors to DRG (UK) Limited, Bristol, England

Filed Jul. 22, 1981, Ser. No. 285,331
Claims priority, application United Kingdom, Jul. 22, 1980, 8023945
Int. Cl.³ B65G *17/36*
U.S. Cl. 198—509 **11 Claims**



1. A bucket wheel comprising:

a wheel structure including means on said structure for mounting the wheel for rotation about a central axis;

a series of buckets at the periphery of said structure;

respective pivot mounting means between the structure and the buckets for permitting pivotal movement of the buckets relative to the structure between first and second opposite end positions in which each bucket has an open entry facing in respective opposite directions peripherally of the wheel;

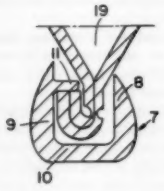
latching means on said structure for engaging and retaining the buckets in said first or second end positions in dependence upon the rotational direction of said wheel, said latching means being displaceable between engagement and release positions, said buckets being freely pivotable when released from the latching means to be displaceable between said first and second end positions, said latching means operating in response to reversal of the direction of rotation of said wheel so as to be sequentially displaced from said engagement position to said release position to permit said buckets to be sequentially pivotally moved from said first end position to said second end position and said latching means being sequentially displaced during continued rotation of said wheel in said reverse direction from said release position to said engagement position to retain said buckets in said second position, whereby the open entries of the buckets face in the direction of rotation of the wheel for either of said directions of rotation.

4,445,609

REFILLABLE SOFT TUBE FOR PACKAGING LIQUID OR PASTE PRODUCTS SUCH AS TOOTHPASTE, POLISH, SHAVING CREAM OR THE LIKE

Jacques Benarrouch, Villeurbanne, France, assignor to Sasson Jeans, Inc., New York, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,778
Int. Cl.³ B65D *85/14, 35/02*
U.S. Cl. 206—277 **6 Claims**



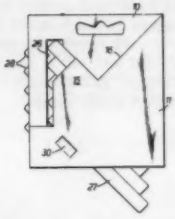
1. A soft tube for packaging a liquid or paste product, comprising a hollow tubular body of deformable material, the top end of which will accept a screw cap, while the bottom end, open before the tube is filled, is intended to be closed, flattened, then rolled upon itself after filling, characterized by comprising a third part, namely a transverse clip of U-shaped cross section having a bottom web, a pair of arms and a ledge extending from one arm, said clip being adapted to be slipped across the bottom end of the body of the tube which has been flattened and folded upon itself and the wall of the tube comprises, near its bottom end a peripheral groove locally thinning the said wall to facilitate and determine its folding upon itself in preparation for placement of the transverse clip, the distance between the peripheral groove and the bottom free edge of the wall of the tube before folding is substantially equal to the height of the clear space bounded inside the clip between the web thereof and the projecting ledge.

4,445,610

PACKAGE OF RAZORS

Richard D. Richards, Lipbook, England, assignor to Wilkinson Sword Limited, England

Filed Apr. 5, 1982, Ser. No. 365,740
Claims priority, application United Kingdom, Apr. 11, 1981, 8111470; Jun. 12, 1981, 8118174
Int. Cl.[3] B65D *85/62, 5/04, 5/44;* A45D *27/29*
U.S. Cl. 206—349 11 Claims



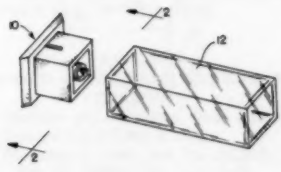
1. A package of razors including a pack, and a nested stack of razors retained within said pack in a side-by-side staggered array, said pack comprising a first panel for forming one side of the pack and having a slot therein for receiving part of each handle of said stack of razors, and for supporting the heads of the razors, and a second panel secured along one side thereof to one side of the first panel for forming the opposite side of the pack, and adapted to be secured along its opposite side to the adjacent side of the first panel to close the pack and extend across the handles of the razors so that the handles are held between the two panels, and means being provided on at least one of said panels to limit the lateral movement of said handles.

4,445,611

PACKAGE FOR DENTAL DRILLS AND THE LIKE

Koichi Shofu, Marina Del Ray, Calif., assignor to Design Applications Incorporated, Marina del Rey, Calif.

Filed Mar. 26, 1982, Ser. No. 362,395
Int. Cl.[3] B65D *85/24, 6/02, 1/24*
U.S. Cl. 206—369 9 Claims



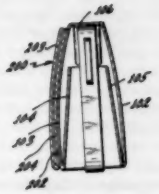
1. A package for the distribution of dental drills, and the like, comprising: a rigid base defining an interior space and having at least one side wall and a bottom; a single elongated split socket member mounted on said bottom at the center thereof and extending upwardly in said interior space in spaced relationship with respect to the interior surface of said side wall; and a rigid cover having at least one side wall and a closed end and an open end, said cover having its open end fitted to said base to support said cover in coaxial relationship with said base to form an enclosure for a drill, or the like, mounted in said socket member and extending upwardly from the base into the interior of the cover in spaced relationship with the side wall and closed end of the cover, the open end of said cover extending over the exterior surface of the side wall of said base when said cover is fitted to said base in friction fit therewith.

4,445,612

SELF-LOCKING BOX FOR TAPE CASSETTES AND INFORMATION FLAP

Warren R. Shepherd, 4310 Greenbush Ave., Sherman Oaks, Calif. 91423

Continuation-in-part of Ser. No. 168,763, Jul. 11, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,787
Int. Cl.[3] B65D *5/72, 5/50, 25/10, 85/67*
U.S. Cl. 206—387 8 Claims



1. A reusable box for releasably holding an article such as a standard cassette cartridge of the type having engageable ridge means facing outwardly from its exterior walls comprising front and rear walls connected by a bottom and side walls and having an open top forming a slot by which said article may be inserted into said box in such an orientation that said ridge faces out toward said slot, said front and rear walls and said side walls being continuous about the top of said box with their upper edges terminating in a common plane, at least one locking flap wall connected from the top of one of the front and back walls and depending downwardly therefrom into the box, said flap wall being formed and joined integrally with the front or rear wall to which it is associated and being creased thereto to lie within said box so as to naturally and freely move toward the other of said front or rear walls by a pivoting motion about the crease, said flap wall including having a dimension to the edge away from the crease so as to engage said ridge of said cartridge, said flap further extending laterally from side wall to side wall and lying within said box, and having sufficient width and structure to resist end-to-end compression as a unitary column structure by being pivotally supported on the one side by being joined to said front or rear wall, so that squeezing on the side walls of the box along the upper top half thereof by the user causes a compression to develop in both the front and rear walls and on the flap wall, the flap and associated front or rear wall flexing and buckling outwardly in response to squeezing, causing the flap to close up to the wall so that the flap and associated wall move outwardly away upon such squeezing after which the cartridge is freely slideable out of the box, the latter, after release, returning to its original shape for reuse and the flap returning to a relaxed state at a ridge engaging angle with the wall, so that when said cassette is reinserted, it is reengaged by the flap.

4,445,613

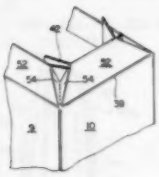
PROTECTIVE SHIPPING AND DISPLAY CARTON

Benjamin J. Cassidy, Waldwick, N.J., assignor to International Paper Company, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,885
Int. Cl.[3] B65D *85/42*
U.S. Cl. 206—418 15 Claims

1. A one piece blank of foldable and resilient sheet material, such as paperboard, the blank being adapted to be folded to form a container, such as a container for a light bulb, the blank being of generally rectangular form and having a plurality of main rectangular panels, the outer two of which have free edges, the inner and remaining panels each being joined by a main fold line and being joined to each of the outer two panels by a main fold line, to thereby define a plurality of main fold lines, a lower portion of each of the main fold lines being cut to thereby define a plurality of bottom closure forming panels, an

upper portion of each of main fold lines being cut to define a plurality of uppermost top closure flaps, a fold line running at right angles to the main fold lines and below the uppermost top flaps, to define a plurality of lowermost top closure flaps, the ends of the uppermost top closure flaps being cut from the adjacent lowermost top closure flaps to form free ears on the



uppermost top closure flaps, a fold line on each of the two ends of each lowermost top closure flap, the lowermost top closure fold lines extending from the lowermost corners of the lowermost top closure flap to the lowermost corners of the corresponding uppermost top closure flap, whereby a carton formed from the blank exhibits a duality of final forms each of which is useful as a container.

4,445,614

PACKAGING BOX WITH PALLET

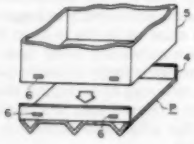
Mitsugi Mitsumori; Hiroaki Hosaka; Hiroshi Sato, and Kouichi Kondou, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 3, 1981, Ser. No. 299,260

Claims priority, application Japan, Oct. 14, 1980, 55-143328

Int. Cl.³ B65D *19/00*

U.S. Cl. 206—599 **5 Claims**



1. A packaging box with a pallet comprising a substantially one-piece rectangular foldable member including a main rectangular panel defining a loading surface region having top and bottom surfaces, two end edges and two side edges, end cleats extending along said two side edges of said loading surface region, a plurality of foldable panels extending parallel to each of said two end edges defining a V-shaped support beam on the bottom surface of said main panel adjacent each end edge and two end panels being bonded to the lower surface of said main panel and said end cleats being disposed perpendicular to the upper surface of said main panel; a bottomless container disposed on said pallet in such a manner that a lower end portion of the container is disposed between said end cleats and means for connecting said lower end portion to said end cleats whereby the upper surface of said main panel forms an interior bottom surface of said container.

4,445,615

SORTING SYSTEM CALIBRATION

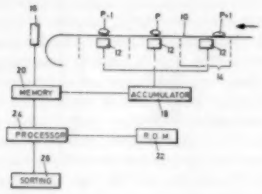
Rolf C. Böhme, Kyalami, and Max M. Lazerson, Northcliff, both of South Africa, assignors to General Mining Union Corporation Limited, South Africa

Filed Dec. 3, 1980, Ser. No. 212,514

Claims priority, application South Africa, Dec. 4, 1979, 79/6566; Jul. 15, 1980, 80/4247

Int. Cl.³ B07C *5/346*

U.S. Cl. 209—555 **5 Claims**



1. A method of sorting which includes the steps of causing a plurality of particles to move sequentially past at least one detector which is responsive to the presence of a desired property in the particles, for each particle, producing from the detector's response an output signal which is dependent on the degree to which the desired property is present in the particle, determining the spacing between the particle and at least one adjacent particle, and applying to the output signal at least one calibration factor which is dependent at least on the spacing and on the output signal of the adjacent particle.

4,445,616

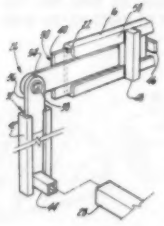
CARGO CONTAINER WITH ADJUSTABLE RETAINING MECHANISM

Fred Mancusi, Kenosha, Wis., assignor to American Motors Corporation, Southfield, Mich.

Filed Jun. 7, 1982, Ser. No. 385,366

Int. Cl.³ A47F *1/00*

U.S. Cl. 211—13 **7 Claims**



6. A cargo container for carrying one or more articles in stored positions comprising:

a frame structure;

a support structure connected to the frame structure, for supporting the articles in their stored positions; and

an adjustable retaining rail structure connected to the frame structure and movable between an access position for loading and unloading of the articles, and a retaining position for retaining the articles in their stored positions, the retaining rail structure including,

a retaining bar which in the retaining position limits displacement of the articles from their stored positions, and in the access position permits free movement of the articles from their stored positions,

at least one slide member, interconnecting the retaining bar and the frame structure for providing sliding move-

ment of the retaining bar in travel between the access position and the retaining position, wherein said slide member is supported and retained on said frame structure in both of said access and retaining positions, and at least one hinge mechanism cooperative with the slide member for providing pivotal movement of the retaining bar in travel between the access position and the retaining position.

4,445,617

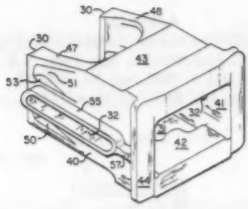
STRIKER FOR A RAILWAY COUPLER

William O. Elliott, Pittsburgh, Pa., assignor to McConway & Torley Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,772, Sep. 16, 1982, abandoned. This application Aug. 25, 1982, Ser. No. 410,080

Int. Cl.³ B61G *9/20*

U.S. Cl. 213—60 **14 Claims**



1. A striker for attachment to a sill of a railway vehicle to transmit forces from a draft key engaged with the shank of a coupler, said striker comprising top, bottom and side walls projecting from a front striker face defining a pocket opening for receiving a shank portion of a coupler, said bottom wall extending between a forward lower part of said side walls for supporting the shank portion of the coupler while extending into said pocket opening, said side walls having aligned horizontal key slots to receive portions of said draft key, front draft lugs on end portions of said side walls facing opposite said striker face for arrangement in a force-transmitting relation with a coupler draft gear, rib sections projecting outwardly from said side walls for attachment to said sill of a railway vehicle, and side wall sections projecting inwardly into said pocket opening above and below the rib sections on each side wall to define recesses therein to inwardly shift the neutral axis of the wall section under an imposed load.

4,445,618

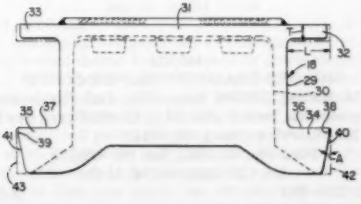
SPRING BIASED ROTARY RAILWAY CAR COUPLER CARRIER

Frederick C. Kulicke, Jr., Tallmadge, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 30, 1981, Ser. No. 335,828

Int. Cl.³ B61G *5/00, 7/10, 9/22*

U.S. Cl. 213—61 **5 Claims**



1. A railroad car coupler assembly comprising:

a yoke;

a car coupler having a coupler head and a coupler shank;

means for mounting a butt end of said coupler shank within said yoke;

a striker having a central aperture through which said coupler shank extends, said striker also having an elongated chamber including a pair of sidewalls and a pair of opposing stops which extend inwardly from said sidewalls into said chamber; and,

a carrier for resiliently supporting said coupler shank, said carrier being slidably received within said striker chamber and being spring loaded against said coupler shank, said carrier including a pair of aligned oppositely outward extending lugs for engaging the underside of said chamber stops to maintain said carrier in said chamber and a pair of aligned oppositely outward extending wings disposed in spaced parallel relation to said lugs, said lugs each having a sloping side portion which slopes away from a respective adjacent chamber sidewall in a direction away from said coupler shank, said lugs extending further outwardly from said carrier than said wings so as to be spaced closer to said chamber sidewalls and said side portions of said lugs being sloped at sufficient angles for allowing limited tilting of said carrier within said chamber around an axis longitudinally bisecting said car coupler.

5. A carrier adapted to be received in a vertically elongated chamber of a striker in a rotary railroad car coupler assembly when the striker is disposed in a normal horizontal operating position, said carrier comprising:

a body portion;

a top plate covering said body portion and having a pair of oppositely extending wings which are in cantilevered relation to the opposite sides of said body portion; and,

a pair of lugs which extend oppositely outward from the opposite sides of said body portion in spaced parallel relation to and a distance greater than said top plate wings, whereby said lugs are adapted to be more closely spaced toward the opposed sidewalls of an associated striker chamber when said carrier is inserted thereinto, said lugs further including flat side portions which slope toward each other in a direction away from said top plate, whereby said carrier is adapted to have the capability of limited tilting within an associated striker chamber around an axis longitudinally bisecting the associated railroad car coupler assembly, said tilting serving to accommodate the rotation of the car coupler assembly and preventing a binding of said carrier within the chamber.

4,445,619

PEDAL BIN

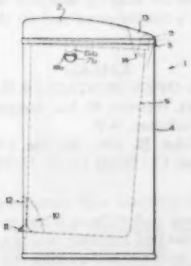
Nick Kubic, Dollard des Ormeaux; Claude Bell, Boucherville, and Serge Seguin, Fabreville, all of Canada, assignors to Les Produits Menagers Culinaire (Baie d'Urfe) Inc., Baie d'Urfée, Canada

Filed Feb. 16, 1983, Ser. No. 466,954

Claims priority, application Canada, Dec. 23, 1982, 418422

Int. Cl.³ B65D *43/26*

U.S. Cl. 220—263 **6 Claims**



1. In a pedal bin of the type comprising a removable basket

eccentrically suspended about an axis inside a rigid upwardly opened box provided with a lid pivotably mounted on one upper flange of said box, in parallel relationship with respect to the suspension axis of the basket, opening of said lid being achieved by action of a pedal against the bottom of the basket to swing it around its suspension axis, said swinging moving upwardly the end of the basket diagonally opposed to the pedal, said end being provided with means for tilting up the lid, the improvements wherein:

the pedal forms an integral part of the basket and the box is provided with an opening giving free access to the pedal from the outside of said box;

the basket is suspended about two pivots located in its forward upper part, each pivot engaging a hinge integral to the box; and

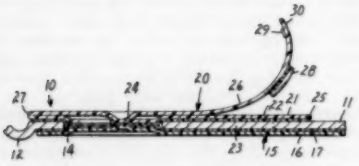
said means for tilting up the lid comprises a finger integral to the basket, said finger projecting upwardly from the upper flange of the basket adjacent the upper flange of the box where the lid is mounted, and having a rounded end coming into contact and following the profile of a cam fixed to the lower part of the lid, said cam being provided, at one end with a stopper to avoid too great opening of the lid.

4,445,620

TAMPER-PROOF CLOSURE FOR CONTAINER

Wilfred R. Brochman, Oakdale, and Richard A. Patterson, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 21, 1982, Ser. No. 380,517
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—271 **4 Claims**



1. A container end assembly comprising:

a container end having a preformed pour opening, an interior and exterior surface, and an easy-opening closure system covering said pour opening comprising:

an interior tape having an adhesive on one surface adhered to the interior surface of the container end and covering said pour opening,

an exterior tape covering said pour opening and adhered to said interior tape in the area of said pour opening and being adhered to the exterior surface circumjacent said pour opening,

a pull tab secured to said exterior tape at one end thereof which extends over said exterior tape, and

rupturable means for holding said pull tab to the exterior tape to define a tamper-proof seal for the pull tab.

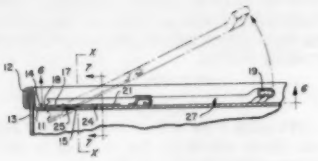
4,445,621

EASY-OPEN CONTAINER WALL

William T. Saunders, Weirton, W. Va., assignor to Stoffel Technologies, Inc., Tuckahoe, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,160
Int. Cl.³ B65D *17/36, 17/34*
U.S. Cl. 220—273 **10 Claims**

1. An easy-open container wall comprising a line of weakness in said container wall defining a tear portion at least partially removable from said container wall, a tab having a line of weakness severing nose end and a lifting end and having hinge means for permitting hinged movement of one portion of said tab relative to another portion of said tab along a hinge line to bring said nose end into forceable engagement with said container wall to rupture said line of weakness and bend a segment of the tear portion inwardly upon lifting said lifting end of the



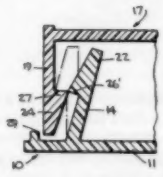
tab, and attachment means for attaching said tab to said tear portion at locations on both sides of said hinge line.

4,445,622

SELF-LOCKING PILFER PROOF CONTAINER

Leonardo Sideri, 47 East 44th St., New York, N.Y. 10017

Filed Jul. 9, 1982, Ser. No. 396,722
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **9 Claims**



1. A non-reusable self-locking container comprising:

a first panel including side wall means extending from a surface thereof and provided with a tab defining cam means and a locking surface;

a second panel including a wall means extending from a surface thereof and provided with a tab defining cam means and a locking surface;

said sidewall means and said wall means being adapted to be telescopically disposed relatively to one another to close said container, said cam means of said first and second panel tabs engaging one another during telescoping movement of said sidewall means and said wall means resiliently to flex at least one of said sidewall means and said wall means away from the other, said locking surfaces assuming a condition of mutual engagement to permanently lock said panels against separation upon completion of said telescoping movement;

said first and second panels once closed being locked against entry to the container until the permanent and visible destruction of the container.

4,445,623

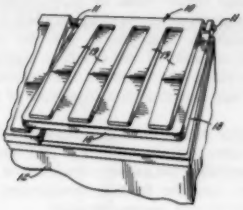
MOLDED TRASH CONTAINER COVER

Byron M. Kolling, 23W040 Seneva Rd.; Jack Bergbreiter, 410 Evergreen Ave., both of Glen Ellyn, Ill. 60137, and Roy Hunn, 21W179 Woodview, Itasca, Ill. 60143

Filed Sep. 30, 1982, Ser. No. 430,278
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 220—343 **3 Claims**

1. A container cover comprising a one-piece body formed of plastic and shaped to have peripheral side flanges to stiffen the outer shape of the cover, said cover also having a plurality of rigs spaced across the body to stiffen the cover into a substan-

tially planar configuration, and said cover having a pair of cylindrical aligned bosses in two of said flanges near one edge



of said body adapted to receive a hinge rod and thus serve as reinforced hinges for the cover.

4,445,624

TANKS FOR TRANSPORTING LIQUIDS

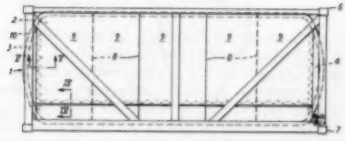
Martin S. Gill, 37B Tomlins Grove, London E3, England

Filed Jun. 1, 1982, Ser. No. 383,430

Claims priority, application United Kingdom, May 29, 1981, 8116548

Int. Cl.³ B65D *90/06*

U.S. Cl. 220—449 **12 Claims**



1. A tank structure for transporting liquid, said structure comprising an elongate tank with closed ends, framework supporting said tank, said framework including tank-bearer members attached to said tank at attachment positions, and a detachable insulating cover for said tank, said cover being detachably securable in position for covering the surface area of the tank, said cover being formed of panel-like sections, each said section comprising a sealed envelope having moisture-impervious inner and outer skins, said inner and outer skins being sealingly interconnected around the peripheries of the respective envelopes, a filling of insulating material within each said envelope, edges of adjacent sections coinciding with said attachment positions of said bearer members to said tank.

4,445,625

VENDING MACHINE HAVING ACCESS BLOCKING MEMBERS

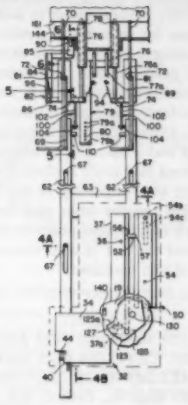
Evelyn Friedman, and William R. Carswell, both of P.O. Box 149, Whitehall, N.Y. 12887

Continuation-in-part of Ser. No. 284,330, Jul. 17, 1981, Pat. No. 4,410,104. This application Sep. 2, 1982, Ser. No. 414,381

Int. Cl.³ B65H *31/20*

U.S. Cl. 221—241 **5 Claims**

1. A vending apparatus having an enclosure with an access opening formed therein for removal of an article therethrough from one side thereof by a customer on payment of a fee, means for supplying articles to be vended to the other side of said access opening, access opening control means including gating means and gating actuating means, said gating means being movable between a first position blocking removal of any articles through said access opening and a second position in which at least one article can be removed through said access opening, said gating actuating means being operable from a starting condition to an intermediate condition to shift said gating means from its first position to its second position and releasably retain said gating means in its said second position, said gating actuating means being responsive to removal of an article through said access opening to release said gating means, and resilient means for shifting said gating means from its second position to its first position following release thereof by said gating actuating means, wherein the improvement



comprises, said gating means including at least two blocking members, and support means movably supporting said blocking members for mutually independent movement between said first and second positions with said blocking members in said first position extending across said access opening and blocking the same.

4,445,626

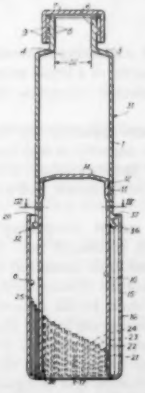
METERING DEVICE FOR DISPENSING SELECTED AMOUNTS OF VISCOUS MATERIAL

Cliff Steffen, Bethel, Conn., and Nicholas P. Cappelli, Wappingers Falls, N.Y., assignors to The Purdue Frederick Company, Norwalk, Conn.

Filed Feb. 10, 1982, Ser. No. 347,506

Int. Cl.³ B67D *5/32*

U.S. Cl. 222—39 **12 Claims**



1. A metering device for dispensing selected amounts of viscous material, said device comprising

a substantially cylindrical container for viscous material having a first open base end of a first diameter and a spaced opposite second closed base end with an opening

therethrough of a second diameter smaller than said first diameter;

a substantially cylindrical plunger of a third diameter slightly smaller than said first diameter and coaxially slidably mounted in said container in a substantially snug manner, said plunger having an axis and a closed plunger head substantially perpendicular to said plunger axis; and

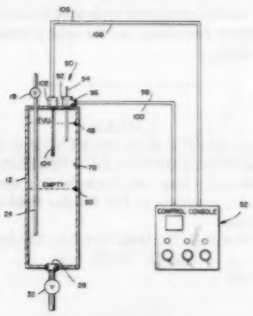
positioning means for selectively positioning said plunger and said container relative to each other at a plurality of different axial positions, said positioning means including a measuring member having an axis, a substantially cylindrical inner surface of a fourth diameter greater than said first diameter, a first base end, a spaced opposite second open base end and a plurality of ribs extending laterally and radially from said inner surface substantially parallel to said member axis, beginning at said first base end and having different lengths from said first base end, said plunger at each of said axial positions forcing a predetermined measured amount of said viscous material out of said opening of said container.

4,445,627

APPARATUS AND METHOD FOR ADJUSTMENT OF VOLUMETRIC CAVITIES FOR GRAVIMETRIC METERING OF LIQUIDS

Vladimir Horak, 353 High St., Closter, N.J. 07624

Filed Oct. 5, 1981, Ser. No. 308,585
Int. Cl.³ B67D *5/06*
U.S. Cl. 222—54 **8 Claims**



1. In a metering tank containing adjustable means for varying the volumetric capacity of a liquid metering cavity within said tank to contain a selected volumetric charge of liquid to be dispensed,

gravimetric adjustment apparatus for varying the selected internal volumetric capacity of said liquid metering cavity to compensate for density changes in said liquid resulting from variations in temperature, said adjustment apparatus comprising

liquid displacement means comprising a solid elongated member positioned to extend into the interior of said metering cavity and to be immersed in the liquid charge therein, for reducing the volumetric capacity of said cavity by an amount equal to the volume of said elongated member which is immersed in said liquid,

and fine precision adjustment means mounting said liquid displacement means for movement relative to said liquid metering cavity whereby said elongated member may be selectively advanced into the withdrawn from said cavity in uniform fractional increments,

said liquid displacement means having a fully-inserted position in which it reduces the capacity of said liquid metering cavity by an amount sufficient to contain a precise selected adjusted volumetric charge of the liquid to be dispensed at the temperature of maximum density of said liquid,

said mounting means being adapted to withdraw said liquid displacement means from its fully-inserted position by selected amounts determined by decrease in density of the fluid at ambient temperature, whereby to increase the volumetric capacity of said cavity to contain a charge of liquid weighing the same as the selected volumetric charge of said liquid at its temperature of maximum density,

microcomputer means having a memory storing the temperature/density characteristics of said liquid,

means for measuring the ambient temperature of the liquid in said cavity and for feeding temperature measurement information to said microcomputer,

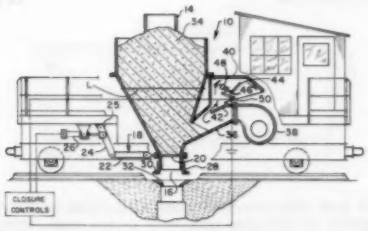
and means operatively coupling said microcomputer means to the mounting means for said liquid displacement means.

4,445,628

APPARATUS FOR SENSING EMPTY HOPPERS

George R. Cain, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,128
Int. Cl.³ F27D *3/00*
U.S. Cl. 222—66 **9 Claims**



1. In a gravity operated hopper for granular material having a top charging opening, sidewalls converging downwardly to form a bottom discharging opening, closure means for said bottom discharging opening, control means for deactivating said closure means to allow discharge of granular material and control means for activating said closure means, wherein the improvement comprises:

(a) means for generating an air current;

(b) an air current conveying duct connected at one end to said means for generating an air current and at its other end connected exteriorly to the sidewalls of the hopper adjacent the bottom discharging opening to surround a lateral opening in said sidewalls and extending upwardly and outwardly therefrom so that air is exhausted primarily into the hopper when the hopper is emptied of granular material;

(c) an air exhausting duct extending from said air conveying duct between said means for generating an air current and the hopper so that air is exhausted through said air exhausting duct when the hopper contains granular material;

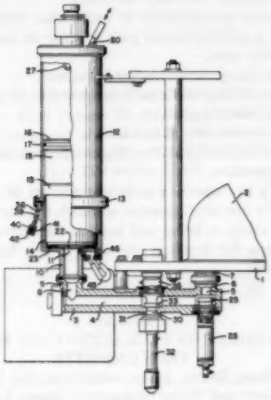
(d) a vane interposed across said air exhausting duct and pivotally mounted so as to pivot to a first position when air is primarily exhausted into said air exhausting duct and to a second position when air is primarily exhausted through the hopper; and

(e) switching means connected in electrical circuit with the control means for activating the closure means and interacting with said vane, such that after the control means for deactivating the closure means has been employed to begin discharge of, then entirely empty the hopper of granular material, the vane is pivoted from its first position to its second position so that the closure means will be activated.

4,445,629
CONTAINER FILLING MACHINE PRODUCT DISPENSING CYLINDER

Frederick B. Doerfler, Pittsburgh, Pa., assignor to Horix Manufacturing Company, Pa.

Filed Nov. 26, 1980, Ser. No. 210,832
Int. Cl.[3] B67D 5/58
U.S. Cl. 222—148 2 Claims



1. In a pressure-fill container filling machine, a vertical dispensing cylinder having an inlet and outlet port in its lower end for liquid product, a piston in the cylinder, the piston being movable upwardly in the cylinder by liquid product forced up through said port, the space in the cylinder below the raised piston forming a volume chamber, the upper part of the cylinder being provided with an inlet for air under pressure to move the piston downwardly to expel liquid product from said volume chamber through said port, the side of the cylinder at the upper end of the volume chamber being provided with a bleed passage for air, and manually operable means normally closing the bleed passage, the improvement comprising a tubular member extending outwardly from said port, said tubular member being provided with a by-pass outlet opening, said cylinder having an inlet opening spaced from said port, a by-pass passage connecting said by-pass outlet opening with said inlet opening, and a check valve in said by-pass passage permitting flow of liquid product from said tubular member only toward said inlet opening for flushing air out through said bleed passage while the piston is held in its lowest position.

4,445,630
EMERGENCY RECOVERY SYSTEM

Rayburn L. Gartman, 9217 Scranton, Houston, Tex. 77075; Donald L. Gartman, 519 Eastlake, Houston, Tex. 77034, and Kenneth T. Kimmons, 855 Regal, Houston, Tex. 77034

Filed Feb. 25, 1982, Ser. No. 352,375
Int. Cl.[3] B67D 5/60
U.S. Cl. 222—464 5 Claims

1. An emergency fluid removal system for transport tanks comprising in combination:

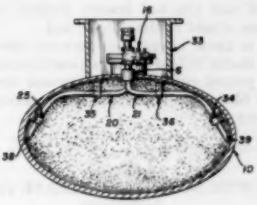
a fluid transport tank having an elongated horizontal configuration in normal upright position, having an opening therein located on the upper surface in the normal upright position for loading and unloading fluids and cover means for closing said opening,

a first valve mounted on said tank, having a conduit extending therefrom, adjacent to a first interior surface of said tank and spaced away therefrom to a point along said surface, and bracket means attached to said interior surface and to said conduit to hold said conduit in place,

a second valve mounted on said tank, having a conduit extending therefrom adjacent to a second interior surface of said tank opposite to said first surface and bracket means attached to said interior surface and to said conduit to hold said conduit in place,

each conduit and said valve attached thereto being in fluid communication with the interior of said tank, and

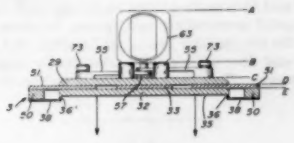
said valves being located along the upper surface of said tank in said normal upright position and said conduits terminating at the sides at approximately the widest point of said tank cross section, whereby fluids in said tank may be removed through said valves and conduits when said tank is capsized on one side thereof and said upper surface in the normal position is generally on a horizontal axis through said tank such that fluids in said tank can be safely removed therefrom.



4,445,631
PATCH POCKET-FORMING, FOLDING AND SETTING APPARATUS

Fernando del Castillo-Olivares, 555 Blackwood St., Greenfield Park, Canada J4V 1H4

Filed May 28, 1982, Ser. No. 383,366
Int. Cl.[3] A41H 43/00; D05C 9/04
U.S. Cl. 223—1 12 Claims



1. A patch pocket-forming, folding and setting apparatus comprising:

(a) a holding blade for holding a precut pocket patch with the folding margin of said pocket patch extending beyond the edge of said holding blade, all around except for the pocket opening;

(b) a patch-forming and folding assembly comprising a lower plate having a substantially flat underface and a downwardly-extending rim at the periphery of said lower plate, except in the region of said pocket opening, to define a cavity at said underface, the contour of said holding blade and of the inside of said rim of said lower plate corresponding to a folded pocket;

(c) means to support said holding blade and said assembly one below the other, with said holding blade and underface substantially parallel, horizontal and in register, from the end corresponding to said pocket opening;

(d) means to raise and lower said holding blade and said assembly while in registry independently of one another, said holding blade insertable within said cavity upon rela-

tive movement of said blade and assembly toward each other, thereby the folding margin of said pocket patch is caused to be shaped and creased downwardly by said rim, with the main portion of said pocket patch sandwiched and clamped between said underface and said holding blade;

(e) folding blades carried by said forming and folding assembly for inward and outward movement relative to the same between a retracted outward position clearing the inside of said rim and inward position underlying the underface of said holding blade; and

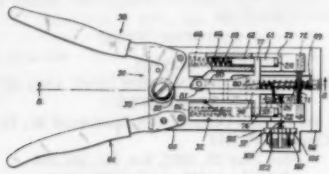
(f) means to cause inward and outward movement of said folding blades to fold the downwardly-extending margin of said pocket patch inwardly around the edge of said holding blade and under the latter during said inward movement.

4,445,632

FIBER OPTIC SCRIBE AND CLEAVE TOOL AND METHOD

Mark Margolin, Lincolnwood, and David Margolin, Skokie, both of Ill., assignors to East-West Precision, Inc., Chicago, Ill.

Filed Dec. 28, 1981, Ser. No. 334,531
Int. Cl.³ C03B *37/16*; B26F *3/00*
U.S. Cl. 225—2 **22 Claims**



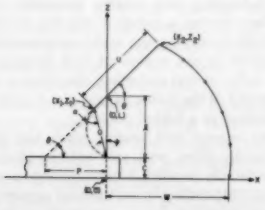
15. A method for scribing and cleaving optical fibers comprising the steps of: supporting and holding a rectilinear section of fiber to be scribed and cleaved at laterally spaced locations without any support therebetween, scribing the exterior contour of said fiber section along an arcuate path in and along a plane located intermediate said spaced locations and lying normal to the longitudinal axis of said section, and selectively tensioning said fiber section with substantially axially applied tension forces to effect cleavage of said section in and along said plane.

4,445,633

AUTOMATIC BONDER FOR FORMING WIRE INTERCONNECTIONS OF AUTOMATICALLY CONTROLLED CONFIGURATION

Harry B. Bonham, Jr., Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 11, 1982, Ser. No. 348,108
Int. Cl.³ B23K *31/02*; H01L *21/90*
U.S. Cl. 228—102 **11 Claims**



1. An automatic bonder for bonding at least one wire between a first location on a workpiece and a second location on a substrate on which the workpiece is carried, comprising:

a wire feeding head,

means for determining a height measurement between the first and second locations,

means using at least the height measurement for producing a desired wire configuration after the wire has been bonded to the first location and prior to when the wire is bonded to the second location, including:

a computer programmed to move said wire feeding head along a predetermined path relative to the workpiece to form the wire,

said path being from the first location:

upwardly to dispense a sufficient amount of wire to form an arcuate shaped portion,

away from the second location,

downwardly to bend the dispensed wire into an arcuate configuration,

upwardly to dispense a sufficient amount of wire to form a straight line configuration to reach the second location,

and circularly to bring said head to the second location,

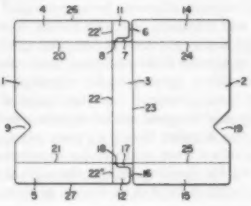
and means for bonding the wire at the first and second locations.

4,445,634

BLANK SHEET OF PACKAGING CASE FOR VIDEO TAPE CASSETTE

Yoshihiro Sato, Tokyo, Japan, assignor to Dai Nippon Insatsu K.K., Tokyo and Victor Company of Japan, Ltd., Kanagawa, both of, Japan

PCT No. PCT/JP82/00040, 371 Date Sep. 17, 1982, 102(e) Date Sep. 17, 1982, PCT Pub. No. WO82/02791, PCT Pub. Date Aug. 19, 1982
PCT Filed Feb. 12, 1982, Ser. No. 420,239
Claims priority, application Japan, Feb. 13, 1981, 56-18177[U]
Int. Cl.³ B65D *5/02*, *85/672*
U.S. Cl. 229—40 **2 Claims**



1. A blank sheet of a case for packaging a video tape cassette, comprising a back panel (3) of elongated rectangular shape having two long edges and two short edges, a first main panel (1) connected to one long edge of the back panel (3) by way of a folding crease line (22), a second main panel (2) connected to the other long edge of the back panel by way of a folding crease line (23), a pair of first side panels (4, 5) connected to both side edges of the first main panel (1) in directions perpendicular to the lengthwise direction of the back panel (3) by way of folding crease lines (20, 21), a pair of second side panels (14, 15) connected to both side edges of the second main panel (2) in directions perpendicular to the lengthwise direction of the back panel (3) by way of folding crease lines (24, 25), and a pair of side flaps (11, 12) connected respectively to edge parts of the first side panels (4, 5) on the side of the back panel (3) by way of folding crease lines (22', 22''), said side flaps (11, 12) having respectively recesses formed along said short edges of the back panel (3) so that gaps (7, 17) are respectively formed between the side flaps and the short edges of the back panel (3), said side flaps (11, 12) having integral projections (8, 18) disposed respectively at proximal parts thereof and protruding to reach

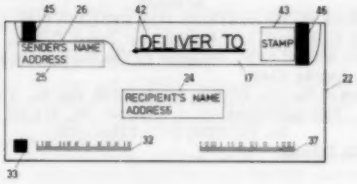
respectively said short edges of the back panel (3) without being connected to the short edges thereby to cause said recesses to terminate short of the folding crease lines (22', 22'') between the first side panels and the side flaps, surfaces to be opposed to each other of the first and second side panels being formed as heat bondable surfaces.

4,445,635

TWO WAY MAILING ENVELOPE

Arthur C. Barr, 1714 Yahara Pl., Madison, Wis. 53704

Continuation-in-part of Ser. No. 259,574, May 1, 1981, abandoned. This application May 19, 1982, Ser. No. 379,658
Int. Cl.³ B65D *27/06*
U.S. Cl. 229—73 **8 Claims**



1. A two way postal envelope comprising:

(a) a front panel and a rear panel peripherally joined except along one edge of each panel, the unjoined edges of each panel being adjacent to one another;

(b) a first flap extending from the front panel along the one edge not joined to the rear panel, the first flap folded over and sealed to the rear panel;

(c) a second flap extending from the rear panel along the one edge not joined to the front panel, the second flap being folded over and disposed between the front and rear panels, the second flap having a portion thereof of uniform width that is narrower in width than the remainder of the flap and which is positioned at one end of the flap, the second flap having activatible adhesion on at least part of the side of the flap that faces the rear panel when the second flap is disposed between the front and rear panels, whereby, after the envelope has been opened by cutting along the intersection between the first flap and the front panel, the second flap may be pulled out of the envelope by a user and folded over and sealed to the front panel;

(d) return address markings on the outward side of the front panel in a return address position such that the markings will coincide with the position of the narrower portion of the second flap and will not be covered by the second flap when it is pulled out and sealed to the front panel, and wherein the wider portion of the second flap will cover the upper right hand portion of the face of the front panel wherein the original postage and cancellation markings are placed;

(e) an optical scanner readable blanking code marking and a return address bar code both imprinted in the lower left hand corner of the outward face of the front panel; and

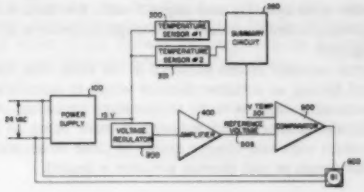
(f) an optical scanner readable key marking on the narrow portion of the second flap which will be exposed when the second flap is sealed ot the front panel whereby the key marking can be utilized ot key an optical scanner to read the return address in the return address block of the face of the front panel rather than the direct address or to a key a bar code reader to read the bar code in the lower left hand corner of the front panel.

4,445,636

TEMPERATURE COMPARISON APPARATUS AND METHODS

Donald Peters, Westfield, Mass., assignor to American Stabilis, Inc., Lewiston, Me.

Filed Aug. 25, 1982, Ser. No. 411,284
Int. Cl.³ F24D *3/00*
U.S. Cl. 236—20 R **12 Claims**



1. A temperature comparison apparatus comprising:

first temperature-sensing means for supplying a current proportional to the temperature of a first source;

second temperature-sensing means for supplying a current proportional to the temperature of a second source;

summing means for providing a first signal proportional to the sum of the currents from said first temperature-sensing means and said second temperature-sensing means; and

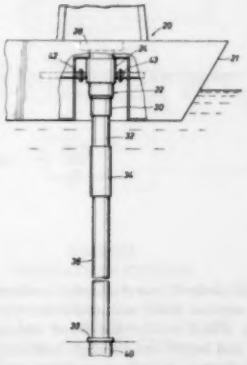
comparator means connected to a preset reference level for producing a second signal indicating the relationship between said first signal from said summing means and said preset reference level.

4,445,637

AIR REGISTER WITH AUTOMATIC ZONE CONTROL

Warren R. Hedrick, Holland, Mich., assignor to Interpace Corporation, Parsippany, N.J.

Filed Dec. 14, 1982, Ser. No. 449,593
Int. Cl.³ F24F *13/14*
U.S. Cl. 236—49 **8 Claims**



1. In an air register adapted to be positioned on the floor of a room in abutting relationship to a wall for distributing air to the room, the air register comprising:

a back housing having a back wall and a bottom wall with openings therein to pass heated air therethrough;

a front housing comprising a front wall and a plurality of louvers to direct heated air passing through said back housing opening in said bottom wall upwardly along the wall of the room;

closure means mounted for pivotable movement between a first position wherein the flow of heated air through the

bottom wall opening is at least substantially restricted and a second position wherein the flow of heated air through the bottom wall opening is substantially unimpeded; and

means for mounting said front housing assembly to said back housing;

the improvement which comprises:

an opening in the front wall of the front housing spaced beneath the louvers;

venturi means in said front housing communicating with said front wall opening and aligned with the back housing opening to draw ambient air through the front wall opening; and

thermal actuator means mounted in the front wall opening and having an actuator element which is extendible and retractable responsive to temperature variations of said thermal actuator, said actuator element being in direct contact with said closure means to close down said closure means as said thermal actuator is heated.

4,445,638

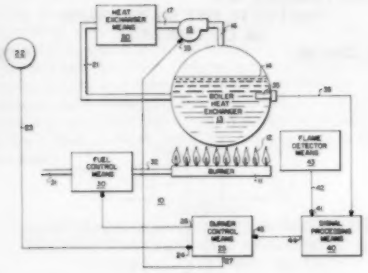
HYDRONIC ANTITRUST OPERATING SYSTEM

John C. Connell, Minneapolis, and Stephen L. Serber, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 20, 1982, Ser. No. 419,647

Int. Cl.[3] **F24D** *3/00*; **F28F** *19/00*

U.S. Cl. 237—8 R **6 Claims**



1. A burner control system adapted to control a burner for a boiler in an antirust mode with said boiler having water circulator means which moves hot water through the heat exchanger of said boiler and through heat exchanger means of space to be heated, including: ambient temperature control means for supplying a signal responsive to ambient temperature changes; burner control means having first input means connected to said ambient temperature control means; said burner control means having at least two output means with a first of said output means connected to fuel control means for said burner; a second of said output means connected to said water circulator means to control the movement of heated boiler water through said heat exchanger means; flame detector means responsive to the presence or absence of flame at said burner; boiler temperature sensor means responsive to the temperature of the boiler water and having signal output means; and signal processing means connected to said flame detector output means and said boiler temperature sensor output means and having signal output means connected to said burner control means; said burner control means responding to said ambient temperature control means and measuring the rate of rise of temperature of said boiler water to determine when to energize said water circulator means in the event that said rate of rise is adequate thereby indicating proper operation of said burner; said burner control means energizing said water circulating means only after the boiler water temperature has risen to a level sufficient to reduce condensation on said boiler heat exchanger thereby preventing rust from forming on said boiler heat exchanger.

4,445,639

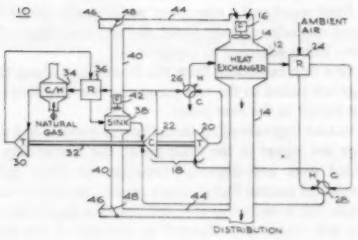
HEAT PUMP SYSTEMS FOR RESIDENTIAL USE

Robert C. Kinsell, Los Angeles, and James C. Noe, Canoga Park, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 172,631, Jul. 25, 1980, Pat. No. 4,347,714. This application Sep. 2, 1982, Ser. No. 414,201

Int. Cl.[3] **F25B** *9/00*; **F25D** *9/00*

U.S. Cl. 237—81 **2 Claims**



1. The method of heating an enclosed space comprising the steps of:

drawing in ambient air to a regenerator for heating by transferring heat from conditioned air from a load heat exchanger;

directing the heated ambient air to the compressor element of a turbo-compressor for conditioning by compressively heating therein;

directing the heated conditioned air to the load heat exchanger;

directing the conditioned air from the regenerator to the turbine element of the turbo-compressor for developing power to assist in driving the compressor before exhausting the air from the turbine to ambient;

driving the compressor with a Brayton turbine mounted on a common shaft and coupled to be driven by combustion heated gases from a combustor/heat exchanger;

directing the expanded gases from the Brayton turbine to a recuperator for inlet air to the combustor/heat exchanger, thence to a sink heat exchanger for transferring waste heat to ambient, and thereafter to the inlet of the compressor for combination with the conditioned air from the regenerator; and

directing a portion of the air from the compressor to the recuperator for inlet air to the combustor/heat exchanger.

4,445,640

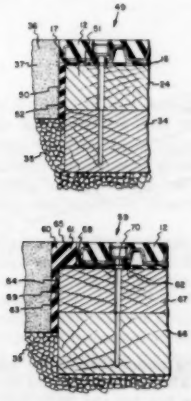
HIGHWAY RAILWAY CROSSING AND CAP THEREFOR

Eugene Caillet, St. Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 31, 1982, Ser. No. 364,161
Int. Cl.³ E01B *26/00*; E01C *5/18, 9/04*
U.S. Cl. 238—8 **10 Claims**

1. A highway railway crossing having:
(a) a railway comprising:
(i) two spaced-apart indefinite length rails fastened to
(ii) a plurality of cross-ties that are positioned perpendicular to the rails and spaced apart from one another along the indefinite length rails, the cross ties being supported by a
(iii) ballast layer, and
(b) a highway comprising a pavement extending at an angle to the railway and
(c) a crossing surface comprising:
(i) a center pad of reinforced rubber-like resilient material positioned between the two rails and in alignment with the highway,
(ii) a side pad positioned between the pavement and one of the rails and in alignment with the highway,
(iii) a shim having an outside end positioned on the uppermost surface of each cross-tie,
(iv) an abrasion pad of rubber-like resilient material positioned between each shim and the respective side pad, said crossing having the improvement which comprises the inclusion of
(v) a cap of rubber-like resilient material having a first leg that extends horizontally between the side pad and its associated shims, and a second leg that extends vertically downwardly over the outside ends of the associated shims.

5. A crossing construction for a railway including a plurality of spaced-apart cross-ties and two parallel rails positioned thereon at right angles thereto comprising:
(a) a plurality of shims positioned one each on said cross-ties, each of said shims having an outside end,



(b) a rubber-like resilient abrasion pad positioned on each shim,
(c) a side pad of resilient rubber-like material having a reinforcing member therein that extends in a direction parallel to the rails, the side pad having openings formed therein through which fasteners joining the side pad and the cross-ties may be positioned, and
(d) an integral cap of resilient rubber-like material having a first leg positioned between the side pad and its associated shims and a second leg covering the ends of the associated shims.

9. An integral cap for a railway crossing having a plurality of cross-ties, a plurality of shims, each having an outside end, positioned on the uppermost surface of each cross-tie, a side pad positioned on the uppermost surface of the shims, said cap being an elongated member formed of resilient rubber-like material having a first leg with openings formed therein and a second leg joined to the first leg at a right angle thereto, said cap being adapted for placement of the first leg between the pad and shims of the railway crossing with the second leg extending over the outermost end of the shims.

4,445,641

CONTROLLED-RELEASE DISPENSER

Richard W. Baker, Bend, Oreg., and Yasuo Ninomiya, Osaka, Japan, assignors to Bend Research, Inc., Bend, Oreg.

Filed Jan. 8, 1982, Ser. No. 338,166
Int. Cl.³ A01M *1/00*; A61L *9/04*
U.S. Cl. 239—6 **12 Claims**

1. A controlled-release dispenser capable of dispensing essentially all of an active ingredient at a zero-order rate of release comprising a membrane controlling the rate of release of said active ingredient by diffusion through said membrane and a microporous reservoir material which is highly permeable to said active ingredient and in which said active ingredient is essentially insoluble, said microporous reservoir material having interconnected pores capable of retaining said active ingredient by capillary forces.

4,445,642

Patent Not Issued For This Number

4,445,643

IRRIGATION SYSTEM

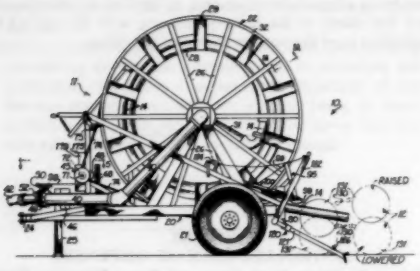
Grover A. Thorsby, Rte. 1, Box 115, and Mark E. Burgess, Rte. 1, Box 82B, both of Madison, Ga. 30650

Filed Jan. 4, 1982, Ser. No. 336,690
Int. Cl.³ B65H *75/00*
U.S. Cl. 239—197 **16 Claims**

1. A reel type irrigation system adapted to be connected to a source of liquid under pressure to distribute the liquid on the ground comprising:
a reel unit including a support frame, a reel rotatably mounted on said support frame, and drive means mounted on said support frame and adapted to drivingly rotate said reel in a given direction when said drive means is connected to the source of liquid under pressure;
a carriage unit including support means movably supporting said carriage unit on the ground and a sprinkling gun

mounted thereon adapted to discharge the liquid therefrom onto the ground when said sprinkling gun is connected to the source of liquid under pressure;

a flexible pipe connected at one end to said reel and at the other end to said support means and said sprinkling gun on said carriage unit so that said pipe is wound around said reel as said reel is rotated to pull said carriage unit over the ground as said pipe is wound around said reel;



tachometer means for detecting the actual rate of movement of said flexible pipe toward said reel unit and thus the rate of movement of said carriage unit, said tachometer means generating an output signal indicative of the actual rate of movement of the carriage unit toward said reel unit; and

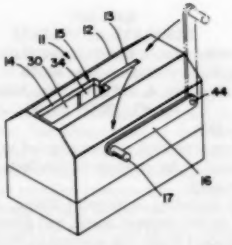
display means operatively connected to said tachometer means and responsive to said output signal for visually displaying the actual rate of movement of said flexible pipe and thus said carriage unit toward said reel unit.

4,445,644

DEVICE FOR DESTROYING HYPODERMIC NEEDLES AND SYRINGES

Walter G. Lemke, 3206 May Rd., El Sobrante, Calif. 94803

Filed Jun. 15, 1981, Ser. No. 273,410
Int. Cl.³ B02C *19/14*
U.S. Cl. 241—99 **5 Claims**



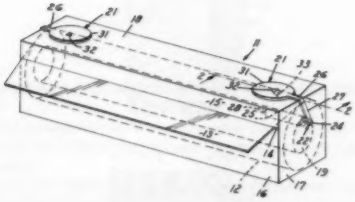
1. A device for destroying hypodermic needle and syringe assemblies, comprising a housing, an intake opening in said housing adapted to receive a syringe assembly therein; a pivot shaft in said housing adjacent to said intake opening; a plurality of disc-like rotating blades secured to said pivot shaft and spaced therealong, each of said rotating blades including a slot extending radially inwardly from the periphery thereof, a plurality of fixed blades, each disposed directly adjacent to one of said rotating blades and including a shearing edge past which said slot is rotatable, means for rotating said shaft and blade assembly from a first position in which said slots open toward said intake opening, past a second position in which said slots intersect said shearing edges of said fixed blades, to a third position in which the sheared hypodermic assembly debris is discharged from said slots, and a plurality of cylindrical members assembled axially on said shaft, each secured adjacent to one of said disc-like blades and having substantially the same diameter, each of said cylindrical members including a slot extending into the periphery thereof and aligned with the slot of the respective blade, said slot adapted to receive and retain a portion of the syringe assembly.

4,445,645

ROLL RETAINING MEANS FOR A DISPENSING BOX

Joseph I. Byer, 2896 Radisson Ave., Windsor, Canada

Filed Jan. 9, 1981, Ser. No. 223,681
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.53 **12 Claims**



1. A roll retaining means adapted for retaining a roll of sheeting material in a box, wherein the roll has an inner peripheral surface and the box has end walls and side walls, said retaining means comprising:

(a) a rod having at least two segments,

(b) a piercing means provided on one of said segments for piercing an end wall,

(c) a sleeve provided on said one of said segments adjacent to said piercing means, said sleeve being insertable through an end wall after said piercing means has pierced said end wall so that said sleeve is positioned in a tangential relationship with the inner peripheral surface of said roll, and

(d) an attachment means on the other of said segments, said attachment means securing said roll retaining means to the box.

4,445,646

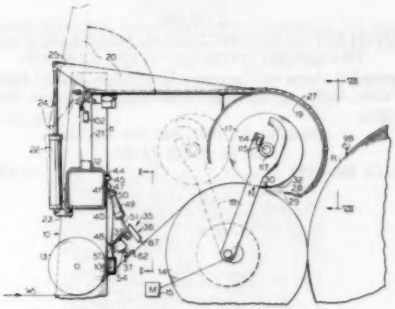
APPARATUS AND METHOD FOR STARTING SUCCESSIVE LEADING ENDS ON TRAVELLING WEB IN A WINDER

Gerald W. Karr, South Beloit, and George H. Wong, Roscoe, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 5, 1982, Ser. No. 355,215

Int. Cl.³ B65H *19/20*

U.S. Cl. 242—56 R **17 Claims**



1. In apparatus for winding web running continuously in a machine direction into successive rolls, and including means for starting winding of a respective leading end of the web onto a respective fresh rotating core, driven by a nipping roll to attain web running speed, for each roll:

slitting means located upstream from said fresh rotating core;

means for operating said slitting means, after a preceeding roll has been wound to a desired diameter and is still turning at winding speed, for starting a fresh leading end on the continuously running web by first slitting the web a limited distance in the machine direction for defining an elongate leading starter tongue area attached at its ends to the web and then completing the remainder of the fresh leading end by slitting the web in cross machine direction from said tongue area;

means upstream from the nip of said core and said nipping roll for partially separating the leading end of said tongue area from the web but leaving said leading end of the tongue area still attached to the web until said leading end of the tongue area has passed through said nip;

and said winding starting means being adapted for tearingly completing separation of said partially separated leading end of said tongue area from said web after said partially separated leading end of said tongue area has passed through said nip and for then directing the tongue area and said remainder of said fresh leading end into winding relation onto a fresh rotating core for winding of the web into another roll.

4,445,647

SUPPLY ROLL HOLDING ARRANGEMENT

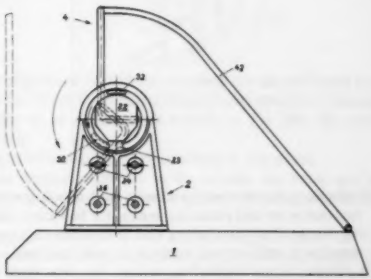
Reinhard Deeg, Keltern-Elmendingen; Folker Galaske, Pforzheim, and Helmuth Kettenbach, Ettlingen, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,652

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136040

Int. Cl.³ B65H *17/52, 23/00*

U.S. Cl. 242—68.4 **5 Claims**



1. A holding arrangement for the supply roll of a tape-shaped recording medium, disposed on the cover of a printer, in which a roll carrier for taking up the supply roll, rests with its projecting ends in the upwardly open bearings of holding brackets capable of being locked by latch bodies rotatable from the outside, which each have an external latch knob characterized in that a paper-deflecting yoke is provided, said latch knobs being each provided with a receptacle having a slot to take up angled off ends of said paper-deflecting yoke, said receptacle extending vertically in relation to the axis of rotation, for taking up the ends of said yoke connecting said latch bodies rigidly with one another, said yoke having one arm inclined towards the printer, with which it rests on said cover and, in the unlocked position of said latch tongues is turned up, said latch tongues being swivelled out of a locked position into a limiting stop position.

4,445,648

SAFETY DEVICE FOR VEHICLES

Willi Bloch, Velpke, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 364,194

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116355

Int. Cl.³ B65H *75/48*; A62B *35/02*

U.S. Cl. 242—107.6 **3 Claims**

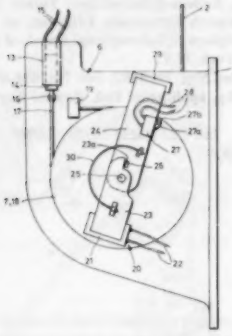
1. A safety device for a vehicle comprising:

(a) a safety belt for restraining a passenger in a normal posi-

tion in a seat and capable of being attached to a belt lock means;

(b) winding means, attached to one end of said safety belt, including a winding roller rotatable about an axis and means for rewinding said end of said belt onto said winding roller;

(c) detection means for detecting when a passenger is in said normal position in said seat and when said safety belt is coupled to said belt lock means;



(d) blocking means associated with said winding means and responsive to said detection means for blocking said winding means from rewinding said belt when said passenger remains in said normal position in said seat; and

(e) release means including means for detecting when a predetermined length of said belt is unwound from said winding means for disabling said blocking means when said predetermined length of said belt has been unwound, thereby permitting rewinding of said belt, wherein said release means includes:

a release switch for disabling said blocking means; and

means for actuating said release switch comprising a lever pivotable about said roller axis; means for selectively coupling said lever to said winding roller when said blocking means is in a blocking condition for rotating with said roller, wherein the coupling means comprises electromagnet means connected to said lever for coupling said lever to said blocking means; and means responsive to the rotation of said lever through a predetermined angle for actuating said release switch.

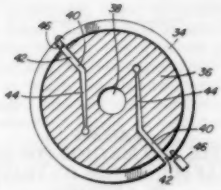
4,445,649

ADJUSTABLE REEL

Masamichi Yataki, Ottawa; Glen W. D. Dack, Almonte, and Paul S. Ertl, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 17, 1981, Ser. No. 274,470
Int. Cl.³ B65H *75/14, 75/24*
U.S. Cl. 242—118.2 **7 Claims**

1. A reel comprising a one-piece molding having a cylindrical barrel portion extending between two flanges, the barrel portion having an outer wrapping surface, each flange extending in a plane perpendicular to an axis of the reel, the reel having at least one slot extending throughout its length, the slot being of uniform cross section through the length of the reel and tapering uniformly from respective flange peripheries to a position radially within the wrapping surface, and wherein the slot has radially outward part extending substantially radially and a second part extending from said radially outward part to a position radially inward of the wrapping surface, the radially inward part extending non-radially, the slot normally open but closeable on pressing parts of the reel on opposite sides of the slot together whereby to reduce the circumference of the barrel portion.

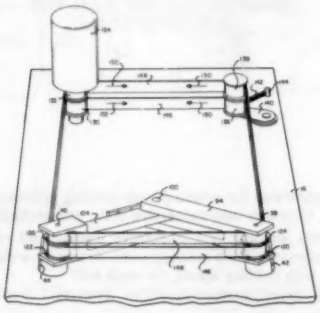


4,445,650

HIGH SPEED BIDIRECTIONAL MAGNETIC TAPE TRANSPORT WITH CONSTANT TENSION

Raymond E. Avra, and Lawrence Herrington, both of Fountain Valley, Calif., assignors to MegaTape Corporation, Duarte, Calif.

Filed Jul. 22, 1981, Ser. No. 285,756
Int. Cl.³ G11B *15/32*
U.S. Cl. 242—192 **12 Claims**



4. A transport for an elongated web member comprising the combination of:

an elongated web member;

first and second rotatably mounted reels having the elongated web member wound thereon and extended therebetween;

first and second rotatable capstans mounted adjacent the first and second reels respectively;

means for normally urging the first and second capstans toward the first and second reels respectively;

means for rotatably driving the first and second capstans in a first direction or in an opposite second direction, the means for rotatably driving including means for driving the second capstan at a greater speed than the first capstan when the first and second capstans are being driven in the first direction and including a first elongated drive member, first and second drive elements of different size engaging spaced-apart portions of the first elongated drive member and first and second unidirectional clutch elements respectively coupled between the first and second

drive elements of different size and the first and second rotatable capstans, and means for driving the first capstan at a greater speed than the second capstan when the first and second capstans are being driven in the opposite second direction and including a second elongated drive member, third and fourth drive elements of different size engaging spaced-apart portions of the second elongated drive member and third and fourth unidirectional clutch elements respectively coupled between the third and fourth drive elements of different size and the first and second rotatable capstans; and

means for converting a difference in the speeds of the first and second capstans into tension in an elongated web member wound on and extended between the first and second reels.

4,445,651

TAPE CASSETTE

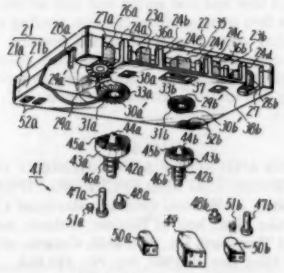
Masanori Kimizuka, Tokyo, and Yoshio Yamanishi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,134

Claims priority, application Japan, Jul. 8, 1981, 56-101319[U]

Int. Cl.³ G03B *1/04*; G11B *15/32, 23/04*

U.S. Cl. 242—199 **4 Claims**



1. A tape cassette comprising, a cassette casing having a plurality of head inserting openings provided in its front surface, a tape path formed therein along the inside of said openings and a pair of hubs provided to wind therearound a tape transported along said tape path, a pair of pinch rollers mounted in said cassette at both end portions of said tape path, capstan engaging cut-out portions formed so as to oppose said pair of the pinch rollers across the surface on which said openings are formed and across at least one of the upper and lower surfaces adjacent thereto, a capstan receivable within at least one of said capstan engaging cut-out portions to drive said tape, driving gear portions formed on at least one end surface of each of said hubs, and driving gear means external to said cassette and engageable with said driving gear portions to drive them in a rotary direction, wherein at least one of said pair of pinch rollers is provided with a stripe pattern on the upper surface or the lower surface thereof, and wherein a through-hole is bored through at least one of the upper and lower halves of the cassette casing and opposed to said pinch roller and means for radiating and detecting said stripe pattern to detect the velocity of said tape mounted adjacent said through-hole.

4,445,652

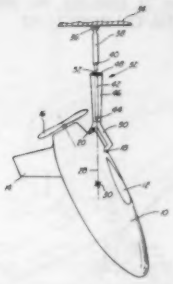
ADJUSTABLE ROCKET THRUST ALIGNMENT DEVICE

Claude W. Engelke; Royal A. Power, and Dale W. Brees, all of Wichita, Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 25, 1982, Ser. No. 361,849

Int. Cl.³ B64D *47/00*; B64F *5/00*

U.S. Cl. 244—1 R **5 Claims**



1. An alignment device for adjusting the takeoff assist thrust vector of a rocket booster in a desired relationship to the center of gravity of an autonomous missile or the like, the device comprising:

an adjustable rear support attached to the missile;

a front support attached to the missile, the front and rear support adapted for receiving the rocket booster thereon; and

a hanging tool attached to the rear support and the front support for suspending the missile therefrom, by adjusting the rear support, the takeoff assist thrust vector of the booster is adjusted relative to the center of gravity of the missile.

4,445,653

METHOD FOR THE LANDING OF AIR AND SPACECRAFTS

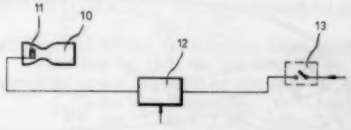
Hans Schwaerzler, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,894

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012789

Int. Cl.³ B64D *17/80*

U.S. Cl. 244—110 D **4 Claims**



1. A method for landing an aircraft or spacecraft by means of a paraglider and a braking thrust booster, comprising the following steps: providing the craft with a paraglider having a drag (D) to lift (L) ratio D/L corresponding substantially to one, providing the craft with propulsion means developing a given maximum thrust, constructing the craft and paraglider combination so that the drag of the combination corresponds to said given maximum thrust at least during a specific phase of a landing operation when the propulsion is at said maximum thrust, activating the paraglider to a deployed position having a drag to lift ratio corresponding substantially to one during the landing approach shortly before touchdown, and activat-

ing the braking thrust booster for cooperation with said paraglider only during a terminal braking phase of a landing operation.

4,445,654

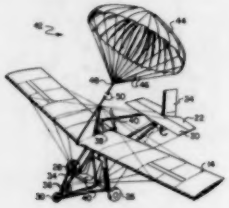
AIRCRAFT RECOVERY CHUTE

James W. Handbury, and Dana Handbury, both of 44 East Hays St., Banning, Calif. 92220

Filed Jun. 21, 1982, Ser. No. 390,513

Int. Cl.³ B64D *17/80*

U.S. Cl. 244—139 **13 Claims**



1. A parachute system for recovery of an ultralight aircraft and/or pilot, said system comprising:

a parachute having a canopy with a plurality of shroud lines and a first elongated cable having a length to position the parachute clear of the engine of said aircraft and connected at one end to the ends of the shroud lines and including attachment means on the other end for attachment to an ultralight aircraft;

a pilot harness to be worn by a pilot and releasably attached to an aircraft and including a chute pack positioned on the chest of the pilot for containing the parachute; and

said attachment means includes quick release clamp means for selective attachment to said aircraft through said harness and directly to said aircraft for support of an aircraft for controlled substantially vertical descent of said aircraft and pilot.

4,445,655

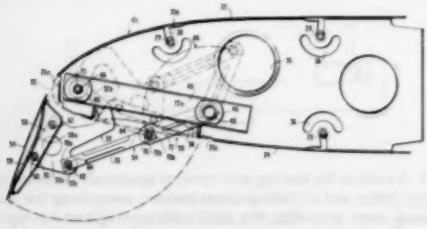
KREUGER FLAP ACTUATING MECHANISM FOR DELTA WING, CANARD TYPE AIRCRAFT

Lawrence K. Hueberger, Reno, Nev., assignor to OMAC, Inc., Reno, Nev.

Filed Feb. 1, 1982, Ser. No. 344,843

Int. Cl.³ B64C *3/50*

U.S. Cl. 244—214 **4 Claims**



1. In an aircraft having wings extending outwardly from each side of an aircraft fuselage and being of transverse airfoil configuration to provide lift to the aircraft and having a frontal leading edge and a rear trailing edge, and wherein the airfoil configuration is formed by a generally convex upper wing surface and a lower wing surface at the leading edge of the wing, and wherein a leading edge flap is mounted to the wing adjacent the leading edge thereof for pivoting between a retracted position in line with the lower surface of the wing and a projected position where the leading edge flap forms an extension of the airfoil convex upper surface of the wing for added lift during aircraft take off and landing, the improvement comprising:

a torque tube extending parallel to and generally the length of each wing portion bearing the leading edge flap and mounted for rotation about its axis internally within the wing and to the rear of the wing leading edge,

a plurality of hinges rotatably mounted within the wing adjacent the leading edge, forward of the torsion tube, and fixed at one end to the rear surface of the leading edge flap at one end,

means mechanically linking the torque tube to the hinges such that during rotation of the torque tube about its axis, the flap is pivoted from retracted position to projected position and vice versa,

a motor operatively coupled to said torque tube for rotating said torque tube bidirectionally about its axis,

biasing means connected to said torque tube for biasing said torque tube in a direction tending to retract the leading edge flap, said biasing means comprising

a coil spring,

a second arm fixed to said torque tube and projecting radially outwardly therefrom at an axial position spaced from said motor,

and wherein said coil spring is fixed at one end to said wing and at its other end to the radially outboard end of said second arm,

and wherein said second arm is angularly positioned on said torque tube and said coil spring is fixed at opposite ends to said wing and to said second arm at positions such that during rotation of said torque tube, the axis of said coil spring passes through the axis of rotation of said torque tube such that said coil spring and said second arm function as a first overcenter mechanism tending to maintain the leading edge flap at projected position when said leading edge flap is driven to projected position absent further operation of said motor tending to drive the leading edge flap towards retracted position.

4,445,656

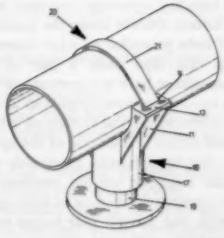
STAND AND STRAP ARRANGEMENT FOR SUPPORTING AND SECURING PIPES

James K. Leitch, 37 Wanless Crescent; Raymond C. Newman, 197 Sheldrake Blvd., both of Toronto, Ontario, and Cameron B. Gray, 51 Thornbank Rd., Thornhill, Ontario, all of Canada

Filed Dec. 8, 1980, Ser. No. 192,866

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—49 **3 Claims**



1. An apparatus for supporting and securing pipes and the like comprising:

a stand having two arcuate arms extending outwardly and upwardly away from each other for supporting pipes and the like,

means for securing said stand to floors and the like, said arcuate arms connected at one end to said securing means, ends of said arcuate arms distal from said securing means

terminating in a first and second flanges respectively, said first and second flanges extending horizontally outwardly,

said first flange having a rectangular opening therethrough,

said second flange having locking teeth along the underside of said flange,

a strap of generally inverted "U" shape for securing pipes and the like to said stand,

one end of said strap having a first tail extending outwardly from and forming an acute angle with said strap, said first tail adapted to extend through said rectangular opening such that the upper surface of said first tail is juxtaposed to the underside of said first flange,

the other end of said strap having a second tail extending inwardly and forming an obtuse angle with said strap,

said second tail having teeth along the upper side of said second tail for mating with said locking teeth of said second flange the arrangement being such that when said first tail of said strap extends through said rectangular opening said teeth of said second tail does not mate with locking teeth of said second flange until downward pressure is applied to said second tail.

4,445,657

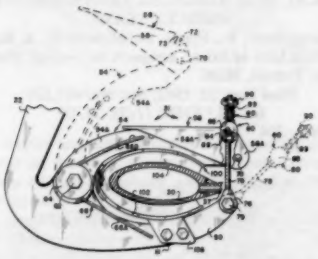
SPRAY BOOM MOUNTING ASSEMBLY

Gerald H. Breckenridge, Rte. 1, Box 169, McCroy, Ark. 72101

Filed Oct. 13, 1981, Ser. No. 310,463

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—73 **8 Claims**



1. A clamping system for securely, removably mounting a spray boom assembly to an agrichemical applicator airplane, the clamping assembly comprising:

a rigid elongated strut having a remote end adapted to be coupled to the wing of said airplane and an integral, spaced-apart jaw end;

said strut jaw end being generally arcuate and having an innermost pivot connection point and an outermost pivot connection point;

a rigid, generally arcuate moveable jaw portion pivotally coupled to said strut jaw end innermost pivot connection point for securing a spray boom between it and said strut jaw end, the jaw portion terminating in an outer pivot point;

jaw locking handle pivotally coupled to said jaw portion at said outermost pivot point for releasably locking said jaw portion in boom holding relation relative to said strut jaw end; said jaw portion locking handle developing an over-center action when rotated relative to said outer pivot point whereby to realasably lock said jaw portion relative to said strut jaw end; and,

barrel connecting means extending between said outermost pivot connection point of said strut jaw end and adapted to be received within a suitable tracking aperture defined in said locking handle.

4,445,658

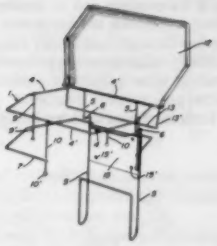
SUPPORT FOR GARBAGE BAGS

René Ferron, 60 de Brésoles St., Apt. No. 409, Montreal, Canada H2Y 1V5

Filed Jun. 28, 1982, Ser. No. 393,155

Int. Cl.³ B65B *67/04*

U.S. Cl. 248—99 **6 Claims**



1. A bag support, specifically adapted for bags of the type having integral handles which determine corresponding apertures within the walls of said bags; said bag support comprising an open frame and a close-fitting cover; said frame including:

(A) a ring-like member, serving as bag support means, and determining an open mouth;

(B) a rear support means, secured to the back portion of said ring-like member, for supporting the latter in substantially horizontal position; and

(C) at least one pair of downwardly-depending bag handle catch members, secured to said ring-like member, each having a free lower end and a transverse stop member secured to said catch member at a zone spaced above said free lower end; said catch members being located at each lateral side of the frame; said cover being pivotally secured to the frame adjacent the back portion of said ring-like member, and being adapted to closely fit over the latter; whereby the rim portion of a bag inserted within said ring-like member is adapted to be folded over said ring-like member with said handles of said bag extending downwardly on the outside of said ring members hooked around the respective free ends of the catch members and retained by said stop members, said stop members being located a distance below said ring member sufficient to retain said bag in a position such that said bag apertures will extend downwardly on the outside of said ring member and said ring-like member will be completely covered by the walls of said bag, whereby the closing of said cover over said open mouth will seal off the content of said bag.

4,445,659

COMBINATION BRACKET AND ADJUSTABLE LADDER TRAY

Paul LaChance, 100 Division St., Rockland, Mass. 02370

Filed May 30, 1978, Ser. No. 910,382

The portion of the term of this patent subsequent to Apr. 1, 1996, has been disclaimed.

Int. Cl.³ E06C *7/14*

U.S. Cl. 248—210 **5 Claims**

1. A combination adjustable ladder tray and bracket for attachment to the hollow rungs of a ladder comprising in combination:

a bracket means comprising two horizontally oriented pipes joined together by a threaded T-joint;

the first of said horizontal pipe members serving as a ladder attachment means;

the second of said horizontal pipe members serving as a tray support means, and terminating in a threaded pipe end fitting;

a vertical pipe member joined to the open end of said T-joint and extending downward therefrom;

a third horizontal pipe member joined to said vertical pipe

member by an elbow joint and extending horizontally under said first horizontal pipes;

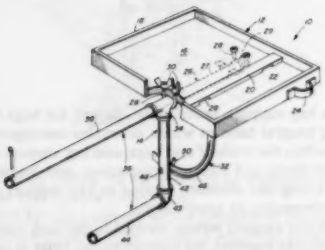
said second and third horizontal pipes being spaced apart such that they fit within two adjacent hollow rungs of a ladder and form a ladder attachment means;

said second upper horizontal pipe member being of sufficient length to extend through the upper adjacent ladder rung;

said second upper horizontal pipe member having a hole therethrough at its extreme end to receive an elongated vertical member to prevent the accidental withdrawal of said pipe member through said ladder rung;

a tray of substantially rectangular shape having a base and 4 upward extending sides adjustably secured to said first upper horizontal pipe support member;

said first upper horizontal pipe member being secured to the



underside of a tray base by two U-shaped brackets, one positioned under said T-member and one positioned under a threaded pipe termination member;

both of said U-shaped brackets secured to said tray base by bolts and nuts such that the nuts of said inner bracket may be tightened and loosened to permit the plane of said tray base to pivot about said horizontal pipe support member;

said tray being contoured to hold and support various tools and supplies of a tradesman working on a ladder;

a bar extending laterally across the inside base of said tray, said bar being sized and positioned to support the upward inclining corrugated base of a roller paint tray base when a roller tray is placed in said tray;

a pair of slots in the base of said lateral bar to receive the inward extending portion of the L-shaped legs of a roller paint tray to secure said paint tray in said ladder tray.

4,445,660

ADJUSTABLE SUSPENSION SUPPORT

Alexander D. Karapita, 38 Robinter Dr., Willowdale, Ontario, Canada (M2M 3R2)

Filed Apr. 9, 1982, Ser. No. 366,915
Int. Cl.[3] B42F *15/00*
U.S. Cl. 248—335 **10 Claims**

1. An adjustable suspension support comprising:

a vertical cylinder and means at the upper end of the cylinder for suspension thereof;

a shaft coaxially located in the cylinder;

brake means slidable in the cylinder and comprising a cylindrical collar coaxial with the shaft, the collar having a plurality of radial apertures located in a circumferential plane thereof, the upper end of the shaft carrying a plug located within the collar adjacent the apertures, the plug having an inverted frustro-conical side wall, a plurality of spherical bearings one located in each aperture of the collar and retained therein by the plug to bear laterally against the cylinder;

grip means carried by the lower end of the shaft and including lever means operable to move the grip means axially downward with respect to the shaft;

a spacer tube concentric with the shaft and freely slidable thereon, the lower end of the tube abutting the grip means and the upper end abutting the collar when the lever means is not operated; and

means connected with the support to carry an object;

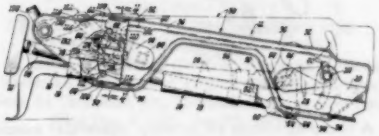
whereby on operating the lever means and exerting an upward force on the grip means the plug is raised with respect to the collar and the brake means is thereby released.

4,445,661

VERTICAL SEAT ADJUSTER ARRANGEMENT FOR VEHICLE SEATS

Otto J. Langmesser, Jr., Fraser, and Richard W. A. Rees, West Bloomfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1982, Ser. No. 407,320
Int. Cl.[3] F16M *11/24, 13/00*
U.S. Cl. 248—394 **4 Claims**



1. A seat support arrangement for mounting a vehicle seat on a vehicle for vertical adjustment thereof relative to the vehicle comprising, in combination,

a pair of laterally spaced elongate seat supports for supporting the seat,

first and second pivot means respective to each seat support,

vertical adjustment means interconnecting a first portion of each seat support and the first pivot means respective to such seat support,

means pivotally mounting a second portion of each seat support to a respective second pivot means,

means conjointly operating the vertical adjustment means to conjointly vertically adjust the first portions of the seat supports as the second portions of the seat supports rotate relative to respective second pivot means,

locking means respective to each seat support, each locking means including a series of detent means separated by abutment means, the detent means of one locking means being respective to an abutment means of the other locking means and collectively representing a vertical position of the seat supports,

means mounting each locking means on a respective seat support for movement therewith and movement relative thereto between: (1) a locked position wherein the detent

means of one locking means engages a respective first pivot means and the abutment means of the other locking means engages a respective first pivot means to lock both seat supports in the vertical position represented thereby, and

(2) a released position wherein both locking means are disengaged from respective first pivot means to permit movement of the seat supports to a different vertical position, the seat supports being located in such different position by the engagement of the detent means of one of the locking means and the abutment means of the other of the locking means with a respective first pivot means,

means biasing both locking means toward locked position, and

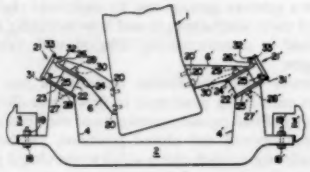
release means for conjointly moving both locking means to released position.

4,445,662

ENGINE MOUNTING STRUCTURE

Masao Fukushima, Fuchu, and Komei Yazaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 7, 1981, Ser. No. 251,854
Claims priority, application Japan, Apr. 17, 1980, 55-51349
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—559 **5 Claims**



1. An engine mounting structure for mounting an automotive engine on the body structure of an automotive vehicle, comprising at least one shock and vibration insulating unit which comprises:

a first coupling member to be connected to the body structure of the vehicle;

a second coupling member to be connected to the body structure of the engine and spaced apart from the first coupling member;

a main resilient block intervening directly between the first and second coupling members; and

vibration cancelling means comprising at least one combination of a mass member, a first auxiliary resilient block intervening directly between the first coupling member and the same member, and a second auxiliary resilient block intervening directly between the second coupling member and the mass member.

4,445,663

ROTATING DEVICE FOR DRILL MAST

Wynand M. Goyarts, Washington, Pa., assignor to Lee-Norse Company, Pittsburgh, Pa.

Filed Apr. 22, 1982, Ser. No. 371,007
Int. Cl.³ F16M *11/10*
U.S. Cl. 248—652 **8 Claims**

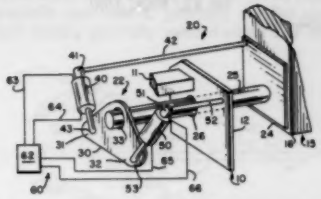
1. A rotator means for positioning at selected drilling angles a drill mast for a roof bolting mining machine having a drill mast assembly and a support structure, said rotator means comprising:

a pivot means for connecting the mast assembly to the support structure to be rotatable relative to the support structure about a pivot;

a second expandable cylinder having one end connected to the support structure;

a first expandable cylinder having one end connected to the mast assembly;

a lever arm having one end connected to the other end of the first cylinder, another end connected to the other end of



the second cylinder, and a pivot connection positioned between the first and second end connecting the lever arm to the support structure, and

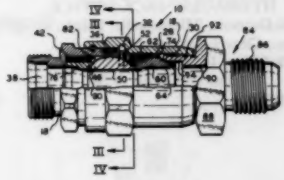
a pressure means for selectively expanding the cylinders to thereby selectively rotate the mast assembly.

4,445,664

AXIAL FORCE OPERATED BALL VALVE

Alan R. Allread, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 26, 1981, Ser. No. 314,754
Int. Cl.³ F16L *37/06*
U.S. Cl. 251—149.2 **7 Claims**

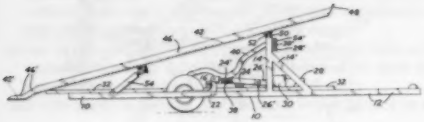


1. A conduit fitting utilizing a ball valve comprising, in combination, a body having a passage defined therein having a longitudinal axis, a ball valve within said passage having a spherical surface, a center and a bore defined within said ball valve extending therethrough having a longitudinal axis, an annular valve seat within said passage sealing engaging said ball valve spherical surface, means supporting said valve seat for axial displacement within said passage, stop means defined in said body passage limiting axial displacement of said valve seat within said passage, biasing means within said passage axially biasing said ball valve into sealing engagement with said valve seat and said valve seat toward said stop means, a pivot fixed upon said ball valve having an axis offset with respect to said ball valve center and transverse and offset with respect to said ball valve bore axis, and pivot retaining means defined upon said body maintaining the axis of said pivot transversely disposed to said passage axis preventing axial displacement of said pivot within said passage and permitting lateral radial displacement of said pivot whereby axial displacement of said ball valve and valve seat within said body passage rotates said ball valve about its center relative to said valve seat selectively establishing communication between said valve seat and ball valve bore to open and close said passage to fluid flow.

4,445,665
VEHICLE SERVICING LIFT

Donald L. Cray, 3737 SE. 36th Pl. Suite 11, Portland, Oreg. 97202

Filed Mar. 26, 1982, Ser. No. 362,300
Int. Cl.[3] E02C 3/00
U.S. Cl. 254—88 7 Claims

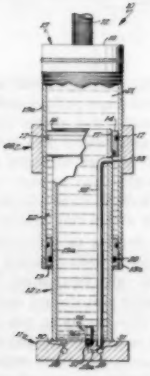


1. A vehicle servicing lift, comprising:
(a) a frame,
(b) a pair of laterally spaced vehicle support ramps each mounted at its forward portion to an elevated fixed pivot associated with the forward end of said frame, the ramps configured to extend rearwardly therefrom a spaced distance beyond the rear end of the frame,
(c) elevating means interconnecting the rear portions of the ramps and the frame for pivoting the ramps about the axis of said fixed pivot,
(d) carriage rail means mounted longitudinally on the frame below the level of the fixed pivot axis of the ramps, the rail means disposed on the frame centrally under the ramps, and
(e) a chair and chair support carriage assembly arranged for removable mounting on the carriage rail means for movement of the chair and carriage assembly longitudinally along the length of the frame centrally under said ramps for supporting a vehicle servicing person in the chair for movement longitudinally under a vehicle.

4,445,666
HYDRAULIC JACK DEVICE

Gertrude D. McDermott, Minneapolis, Minn., assignor to Hydra-Jack, Inc., Clear Lake, Iowa

Filed Nov. 16, 1981, Ser. No. 321,802
Int. Cl.[3] B66F 3/24
U.S. Cl. 254—93 H 5 Claims



1. A hydraulic jack, comprising:
a base;
an elongate, vertically disposed, cylindrical, fixed member mounted on said base and having an open, upper end, an annular element affixed to said fixed member at the upper end thereof and projecting radially outwardly therefrom;
an elongate, cylindrical, vertically disposed, shiftable movable member having a diameter larger than said fixed member and positioned exteriorly around the latter and having a closed upper end, an annular element affixed to the lower end of said movable member to sealingly engage the fixed member, said annular element on said fixed member sealingly engaging said movable member;
a variable lifting chamber defined by the interior of said fixed member and by that portion of the movable member located above the annular element on said fixed member, a variable lowering chamber defined by the interior of said movable member located below said annular element on said fixed member;
a pair of primary passages in said base each being connected to a source of fluid under pressure, one of said passages being connected in communicating relation to said extension chamber and said other passage being connected in communicating relation with said retraction chamber whereby when fluid is directed into said extension chamber, said movable member will be shifted vertically upwardly and fluid will be evacuated from the retraction chamber, and when fluid is directed into said retraction chamber, the movable member will be shifted vertically downward and fluid will be evacuated from said extension chamber;
a pair of orifices each being disposed between one of said passages and one of said chambers and each orifice having a cross-sectional size substantially less than the associated passage to thereby reduce the volume flow of fluid between a primary passage and its associated chamber;
a control valve mechanism in said base including a chamber disposed in communicating relation with said primary passages;
said control valve mechanism including a pair of check valves each being positioned in flow-controlling relation with one of said primary passages and each being movable between opened and closed positions, yieldable means normally urging each check valve to the closed position to prevent the return of fluid through said passage, each valve being opened in response to fluid pressure exerted thereon from said source;
a shiftable valve actuator disposed in said primary passages and being shiftable in response to fluid pressure produced by fluid flowing through one of said primary passages from said source to cause the valve actuator to engage and unseat the check valve in the other primary passage to permit the return of fluid from the last-mentioned passage and permitting the other valve to be opened in response to the pressure of fluid flowing from said source;
a transfer passage in said base intercommunicating said extension chamber with the primary passage for said retraction chamber, a normally closed pressure-responsive valve disposed in flow controlling relation in said transfer passage whereby when the jack device is in a raised static condition and the pressure in the extension chamber exceeds a predetermined amount, the pressure-responsive valve will open and permit fluid to flow through the transfer passage into the retraction chamber.

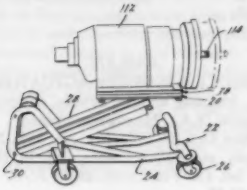
4,445,667
ALIGNMENT ADAPTER AND SUPPORT

Donald R. Webb, 3500 N. Royston Rd., Potterville, Mich. 48876

Filed Feb. 19, 1982, Ser. No. 350,212
Int. Cl.[3] B66F 5/04
U.S. Cl. 254—134 12 Claims

1. An alignment adapter and support for use with a jack having a lifting head, said alignment adapter and support comprising, in combination, a base adapted to be fixed to said lifting head, a carrier, means mounting said carrier on said base, bearing means disposed between said carrier and said base, means limiting longitudinal, lateral and angular movement of said carrier relative to said base, a pair of elongate side rails mounted on opposite sides of said carrier, a pair of brackets, means adjustably mounting said brackets on said side rails,

adjustable workpiece engaging means carried by each of said brackets and adapted to support one end portion of a workpiece, adjustable stanchion means supported by said side rails



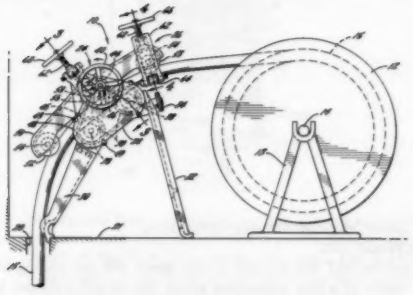
at a position remote from said brackets, and means carried by said stanchion means for supporting the other end portion of a workpiece.

4,445,668

CABLE FEEDING SYSTEM

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Filed Jul. 26, 1982, Ser. No. 401,866
Int. Cl.³ B65H *17/34, 17/22*
U.S. Cl. 254—287 **5 Claims**



1. A cable feeding device such as may be used to controllably lower hanging cable in association with passage means between floors of a building, comprising in combination, a housing, leg means for supporting the housing on the floor in respect to the passage means of said floor, said housing carrying a plurality of rollers defining a guideway for the cable between the rollers disposed on opposite sides of the cable, means for positively manually rotating at least one of the rollers for driving the cable through the housing guideway, means for positively urging a roller on one side of the cable toward a roller on the other side of the cable to increase resistance against downward pulling of the cable through the guideway between the rollers, brake means associated with one of the rollers comprising support means carrying a brake shoe held spaced from a roller so that the cable passes between the shoe and said roller, and manually operated means for adjustably relatively moving said roller and brake shoe to clamp and hold the cable in a fixed position between the roller and brake shoe.

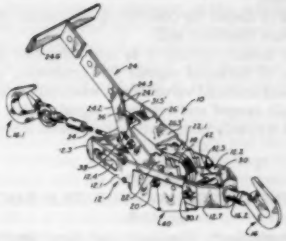
4,445,669

CABLE TENSIONING DEVICE

Richard C. Wilson, Champlin, Minn., assignor to Consolidated Cable and Rigging, Inc., Miami, Fla.

Filed Aug. 18, 1981, Ser. No. 293,889
Int. Cl.³ B66D *3/02, 1/34, 3/14*
U.S. Cl. 254—369 **7 Claims**

3. A cable tensioning device comprising open frame means, a rotatable, cable-winding drum carried in the frame means, ratchet wheel means coaxially attached to and rotatable with the drum, holding pawl means in operative association with the ratchet wheel means for normally limiting rotation of the ratchet wheel means to a single direction, and a reciprocable handle including driving pawl means engageable with the ratchet wheel means for driving the drum in the single direction as the handle is reciprocated, the open frame means comprising generally coextensive, generally parallel rigid strap lengths each having generally parallel edges and having at-



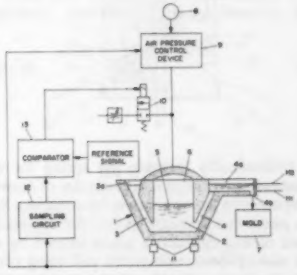
tachment means along said edges adjacent but spaced equally from coextensive ends of the strap lengths, and cable guide means comprising an apertured, rigid plate having attachment means at opposed ends thereof attached to the attachment means of the strap lengths to prevent movement of the plate longitudinally of the strap lengths and to maintain spacing between the strap lengths.

4,445,670

APPARATUS FOR CONTROLLING A PRESSURE-TYPE FURNACE FOR POURING MOLTEN ORES

Shizuo Hayashi, Suzuka, Japan, assignor to Fuji Electric Company, Ltd., Japan

Filed Feb. 3, 1982, Ser. No. 345,223
Claims priority, application Japan, Feb. 24, 1981, 56-26276
Int. Cl.³ B22D *39/00*
U.S. Cl. 266—80 **3 Claims**



1. A pressure-type furnace for pouring molten metal comprising:

a reservoir for storing said molten metal;

an inlet passage in fluid communication with said reservoir for replenishing said molten metal;

an outlet passage in fluid communication with said reservoir for pouring said molten metal;

an air pressure chamber disposed above said reservoir for adjusting the level of said metal in said reservoir;

a source of air pressure for supplying pressurized gas to said air pressure chamber;

means coupled to said air pressure source for controlling the supply of said pressurized gas to said air pressure chamber;

a load cell and a sampling circuit means for intermittently generating signals which are successively representative

of the instantaneous amount of molten metal in said furnace;

circuit means responsive to differences between said successive signals for generating signals representative of the rate of variation in the amount of said molten metal in said furnace;

means for generating a reference signal representative of a specified rate of variation in the level of molten metal in said furnace;

solenoid valve means for controlling the release of air from the pressure chamber; and

comparator means responsive to said reference signal and said rate of variation signals for generating signals to operate said solenoid valve means when said rate of variation signals exceed said reference signal so that said molten metal is evenly poured when said metal is replenished.

4,445,671

GAS SPRING INCLUDING HYDRAULIC LOCKING MEANS

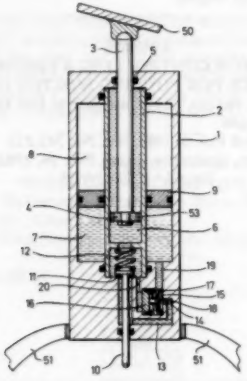
Hermann Reuschenbach, Rossbach, and Egon Sentinger, Koblenz, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,470

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040483

Int. Cl.³ F16F 9/06; A47B 9/10

U.S. Cl. 267—64.12 **11 Claims**



1. In a hydraulically lockable gas spring for continuous height adjustment of an object, in particular of drawing-tables, including hydrauylic locking means comprising a liquid-filled cylinder, a piston rod sealingly guided for movement inward and outward of said cylinder, a piston carried by said piston rod within said cylinder, said piston rod being connected to said object, the cavity of said cylinder being connected to a second liquid chamber via an externally controlled locking valve, and said second liquid chamber being subjected to the pressure of a pressurized gas contained in a gas chamber, the improvement comprising:

piston rod drop preventing means associated with said piston rod, comprising a liquid connection line between said cylinder cavity and said second liquid chamber, and pressure responsive valve means responsive to an excess of a predetermined pressure differential between said cylinder cavity and said second liquid chamber for controlling liquid flow through said connection line so as to prevent the sudden dropping of said piston rod, said pressure responsive valve means comprising

a piston valve acted upon on one side by the pressure of the cylinder cavity and upon the other side by the pressure of the second fluid chamber,

a biassing spring acting on said piston valve in opposition to the pressure within said cylinder cavity, and

a valve disc connected to said piston valve to close said connecting line in the presence of said excess pressure differential.

4,445,672

SHOCK ABSORBER-ACTUATOR

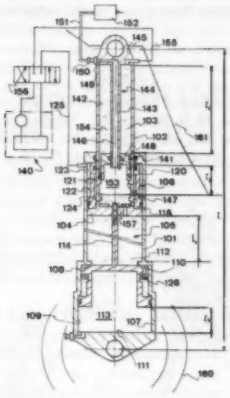
André Turiot, Morsang s/Orge, France, assignor to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Oct. 28, 1981, Ser. No. 316,020

Claims priority, application France, Oct. 30, 1980, 80 23190

Int. Cl.³ F16F 9/06; B60G 17/00

U.S. Cl. 267—64.16 **6 Claims**



1. Shock absorber-actuator comprising:

a cylinder **101**,

a hollow rod **102** defining a first space **103** and sliding by means of a first separating piston **104** in said cylinder to define in said cylinder two variable volume chambers, a first chamber **105** between said first separating piston **104** and one head of said cylinder **101**, and a second annular chamber **106** between the first separating piston, the cylinder **101** and said rod **102**, and means for establishing communication between the first chamber **105** and said space **103**, a second separating piston **141** capable of sliding in a sealed manner in said space **103** to divide said space into an upper part **154** and a lower part **153**, the upper part **154** containing an compressible fluid and the lower part **153** containing compressible fluid, means **147** defining a lower limit position for said second separating piston **141** in said space **103**, and means **140**, **156**, **155** for varying as desired the volume of incompressible fluid in said upper part **154**.

4,445,673

SHOCK ABSORBER AND AIR SPRING ASSEMBLY

Ray Clark, Pewaukee, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Jan. 15, 1982, Ser. No. 339,305

Int. Cl.³ F16F 9/04

U.S. Cl. 267—64.24 **9 Claims**

1. An integral shock absorber and spring assembly for remotely adjusting the amount of damping on an upstroke of the shock absorber comprising:

(a) a first base;

(b) a rod projecting from said first base;

(c) a second base;

(d) a cylinder projecting from said second base, said cylinder containing a first bore having a first end and a second end,

the first end being closed by a cap through which said rod slidably projects;

(e) a piston carried by said rod within said first bore;

(f) a reservoir for hydraulic fluid;

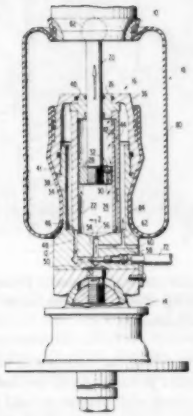
(g) a first path of fluid communication from the first end of said first bore to said reservoir, said first path including,

a first longitudinal conduit in said cylinder,

a second radial conduit leading from the first end of said bore to said first longitudinal conduit,

a second blind longitudinal bore in said second base in communication with said first longitudinal conduit,

a third radial bore in communication with said second blind longitudinal bore and containing an adjustable



continuous flow control valve, said control valve connected to adjusting means which permit remote adjustment of the fluid flow across the valve, and a fourth longitudinal bore in said second base in communication with said third radial bore and said reservoir;

(h) a second path of fluid communication from said reservoir to the second end of said first bore;

(i) a one-way valve contained in said second path of fluid communication which permits fluid flow towards the second end of said first bore, but prevents it in the opposite direction; and

(j) a spring disposed to hold said piston at an intermediate position in said cylinder.

4,445,674

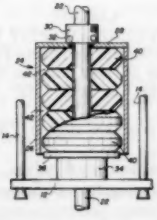
SHOCK ABSORBER FOR AN OIL WELL PUMPING UNIT

Donald H. Clayton, Jr., 4005 Kingswick, Arlington, Tex. 76016

Filed Apr. 29, 1982, Ser. No. 373,049

Int. Cl.[3] F16F *1/36*; F16H *21/32*; G05G *3/00*

U.S. Cl. 267—141 **6 Claims**



1. A shock absorber for use with an oil well pumping unit having a horizontal hanger bar suspended by cables, and there being a vertical polished rod having its lower end connected to a string of sucker rods for actuation of a pump in the borehole, and the hanger bar having an opening through which the polish rod extends, comprising:

(a) a tubular body having a closed top and an open bottom, and the top having a central opening through which the polished rod passes;

(b) a rigid spool having a central opening which is significantly larger than the diameter of the polished rod, such that the polished rod may pass through said central opening without any risk of establishing rubbing contact with the inner surface of said spool, and the lower face of said spool being configured so as to rest on top of the hanger bar;

(c) a circular plate having a diameter slightly less than the internal diameter of the tubular body, and the plate having a central opening which is sufficiently large as to preclude interference with the polished rod, and the plate having an upper surface which is substantially flat and a lower surface which is configured to rest on top of the spool;

(d) a plurality of elastomeric discs positioned in a stack within said tubular body, and each disc having an external diameter slightly less than the internal diameter of the tubular body, and each disc having an axial opening for receiving the polished rod, and the height of the stack of elastomeric discs in their uncompressed condition being approximately the same as the height of the tubular body, and the combined height of the rigid spool and the stack of compressed discs being more than the height of the tubular body when the discs are fully compressed within said tubular body, whereby the bottom edge of the tubular body is prevented from making contact with the hanger bar when a downwardly directed load is placed on the top of the tubular body by the polished rod.

4,445,675

WORK-CLAMPING UNIT FOR USE IN MACHINE TOOLS

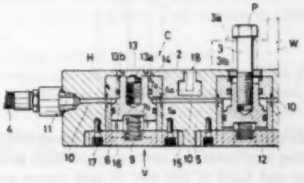
Ichiro Kitaura, Itamishi, Japan, assignor to AIOI Seiki Kabushiki Kaisha, Japan

Filed Nov. 18, 1981, Ser. No. 322,660

Claims priority, application Japan, Dec. 2, 1980, 55-173384[U]

Int. Cl.[3] B23Q *7/00*

U.S. Cl. 269—20 **10 Claims**



1. A work-clamping unit for use in machine tools, said work-clamping unit comprising:

a base plate made of steel and provided with a top surface and a bottom surface;

said base plate including a plurality of separate and identical hydraulic cylinders totally embedded therein, and a stopper means provided on the bottom surface of the base plate in engagement with recesses in said hydraulic cylinders; said hydraulic cylinders being disposed in a given regular pattern, with each of said separate cylinders spaced a given regular distance longitudinally and transversely from each adjacent one of said separate cylinders, respectively;

each of said hydraulic cylinders including a piston vertically movable beneath said top surface of said base plate, and an

oil chamber for actuating said piston downward, said stopper means in engagement with recesses provided in said piston, said piston having means for enabling a clamping member to be secured thereto so as to effect a unitary movement of said piston and said clamping member;

said stopper means provided to prevent rotation of said piston when said clamping member is secured to said piston and to fasten said cylinder to said base;

said top surface having openings for said clamping members to pass through, each of said openings being concentric with each of said hydraulic cylinders; and

said base plate including an oil path for supplying each of said hydraulic cylinders with hydraulic pressure, said oil path being communicated with at least a hydraulic supply port, said oil path communicating in series with said oil chambers; hydraulic pressure from one cylinder to another.

4,445,676

FLUID-OPERATED BELL CRANK CLAMPING DEVICE WITH ELASTIC SPRING LINK AND RELEASABLE CLAMPING ARM

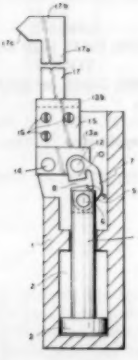
Josef-Gerhard Tünkers, Ratingen, Fed. Rep. of Germany, assignor to Tuenkers Maschinenbau G.m.b.H., Ratingen, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,455

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130942

Int. Cl.³ B23Q *3/02*

U.S. Cl. 269—32 **9 Claims**



1. A fluid-operated clamping device comprising support means forming a cylinder; a piston reciprocatable in said cylinder; a piston rod fixed at one end to said piston and having opposite free end projecting beyond said cylinder; a bell crank mounted on said support means for tilting movement about a pivot axis substantially normal to said piston rod and having a first arm and a second arm extending transverse to said first arm; a clamping arm connected to the other arm of said bell crank readily releasably so as to allow removal of parts of the clamping device from said clamping arm for their replacement without removing said clamping arm from its working position; and spring link means formed at a central portion thereof with a slot extending from one side thereinto and partly dividing said spring means into two springy end portions pivotally connected with said free end of said piston rod and one of said arms of said bell crank respectively so as to allow clamping of workpieces with a substantially constant clamping force and also clamping of workpieces having different thicknesses.

4,445,677

CLAMPING APPARATUS FOR PLASTIC PIPE

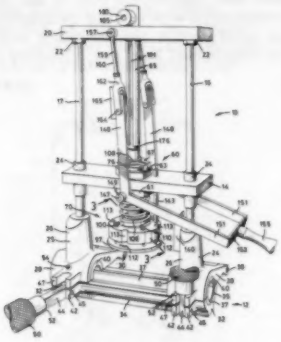
Bent J. Hansen, Caledon East, and Clifford F. Thompson, Weston, both of Canada, assignors to Cliffside Pipelayers, Scarborough, Canada

Filed Mar. 15, 1982, Ser. No. 358,359

Claims priority, application Canada, Feb. 1, 1982, 395274

Int. Cl.³ B25B *1/20*

U.S. Cl. 269—41 **8 Claims**



1. An apparatus for clamping a plastic fitting against a plastic pipe and for holding them together with a predetermined clamping force, comprising:

a carriage,

guide means for guiding the carriage in vertical motion,

a fixed pipe support portion below the carriage,

a frame portion fixed with respect to said pipe support portion,

a first toggle link pivoted to the carriage at a first axis,

a second toggle link pivoted to said frame portion at a second axis, the two toggle links being pivoted to each other at a third axis,

first means to prevent the toggle links from going significantly past a dead center position in which the three axes are aligned in an approximately vertical direction, and the carriage is in its lowermost position,

second means connected to the carriage for holding said plastic fitting,

and lever means for rotating one of said toggle links, the lever means including a lever fixed with respect to said first toggle link and extending at an angle with respect to the first toggle link, so that when the three axes are in alignment the lever extends in a generally sidewards direction.

4,445,678

PRECISION ALIGNED SPLIT V-BLOCK

Irwin S. George, 3240 Siringo Rd., Santa Fe, N. Mex. 87501

Filed May 24, 1982, Ser. No. 381,453

Int. Cl.³ B25B *1/00*

U.S. Cl. 269—88 **7 Claims**

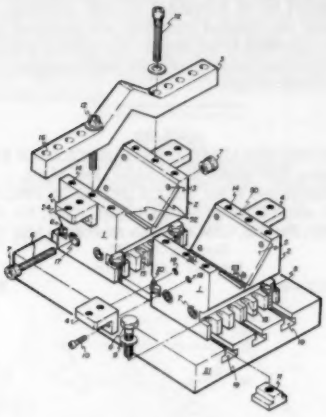
1. A light-weight, precision aligned V-block clamping device comprising:

(1) two symmetrical and equal halves,

(2) means for securing together the halves to form essentially a V-notch,

(3) means for repeated and accurate alignment of the V-block device by using two, round key lugs in the base of one half of the V-block device, said key lugs being placed

in T-slots of a mill table so as to form an angle selected from the class consisting of 30°, 45°, 60° and 180°, and



(4) means for attaching the V-block device to the mill table using the T-slot of said table.

4,445,679

APPARATUS FOR TRANSPORTING SINGLE SHEETS OF DIFFERENT RECTANGULAR FORMATS

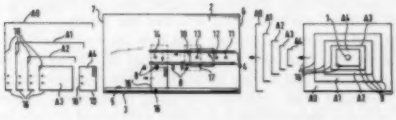
Otto Bay, Luzernstrasse 45, CH-4553 Subingen, Switzerland

Filed Dec. 18, 1981, Ser. No. 332,305

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048298

Int. Cl.³ B65G *47/24;* B65H *7/10, 9/08*

U.S. Cl. 271—227 **12 Claims**



1. Apparatus for transporting single flexible sheets having different rectangular formats in succession to an automatic device for further processing, said apparatus comprising:

means defining a flat sheet-advancement path for transporting the sheets in a transporting direction to the automatic device;

sheet advancing means associated with said path for advancing each sheet in a straight line on said path in the transporting direction;

switchable rotation-inducing means associated with said path and switchable between an inactive position and an active position in which a rotation of a sheet at a selected location along the path is induced; and

sensing means operatively associated with said path and connected to said rotation-inducing means for sensing each sheet being transported along said path, recognizing at least one selected sheet format and switching said rotation-inducing means into its active position in response to recognition of the at least one selected format;

said sensing means comprising a plurality of sheet sensors disposed at respective locations along said path and spaced apart in the transporting direction with a separation corresponding to the at least one selected format;

said rotation-inducing means comprising a holder movable when said rotation-inducing means is in its active position into contact with a sheet at the selected location for causing that sheet to have a stationary axis of rotation perpendicular to the plane of said path, and control means for maintaining said rotation-inducing means in its active position for a time sufficient to enable a sheet contacted by said holder to undergo a rotation by 90°; and

said sheet advancing means being constructed to permit slippage of a sheet at the selected location for permitting such rotation to occur.

4,445,680

SHEET DISTRIBUTION METHOD

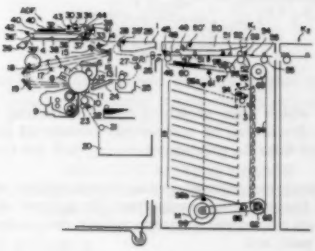
Hideo Kikuchi, and Tamaki Kaneko, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,287

Claims priority, application Japan, Sep. 28, 1979, 54-124873

Int. Cl.³ B65H *39/11*

U.S. Cl. 271—290 **4 Claims**



1. A sheet distribution method for collating a plurality of sets of copies produced by a copying machine into respective bins of a collating apparatus operatively connected to the copying machine, each set of copies consisting of one copy of each respective page of an original document, comprising the steps of:

(a) providing first display means;

(b) displaying a total number of sets of copies to be produced and collated on the first display means;

(c) computing whether the total number of sets is greater than a number of available bins in the collating apparatus;

(d) when the total number of sets is smaller than the number of available bins, collating the sets of copies into the respective bins in a single collation operation;

(e) when the total number of sets is greater than the number of available bins, collating the sets of copies into the respective bins in a plurality of successive collation operations;

(f) providing second display means;

(g) during collation of copies of a page of the document by the collating apparatus, computing a total number of copies of said page which have been collated; and

(h) displaying the total number of copies on the second display means.

4,445,681

APPARATUS FOR REMOVING FLEXIBLE FLAT PRODUCTS FROM A PRODUCT STREAM

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 28, 1981, Ser. No. 297,216

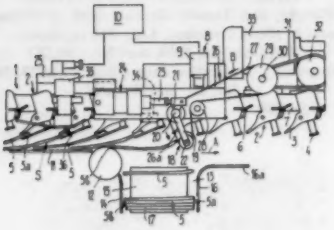
Claims priority, application Switzerland, Sep. 16, 1980, 6923/80; Apr. 9, 1981, 2388/81

Int. Cl.³ B65H *29/04*

U.S. Cl. 271—300 **35 Claims**

1. An apparatus for the removal of flexible, flat products, especially printed products, from a product conveying stream moving in a predetermined product conveying direction and defining a product conveying path, comprising:

a conveyor device;
said conveyor device being provided with gripper elements arranged in spaced relationship from one another at said conveyor device;
at least one release device which can be selectively switched-on and switched-off;
said release device, when assuming its switched-on condition, opening the gripper elements moving therepast;
at least one stop means arranged at the region of the release



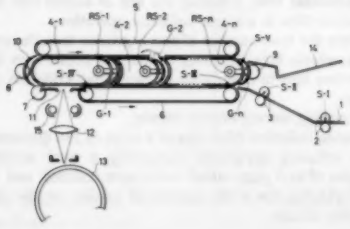
device which upon switching-on and switching-off the release device can be respectively introduced into and retracted from the product conveying path for the products;
each said stop means comprises an impact surface which is moved in a direction away from the gripper elements when said stop means is introduced into the product conveying path; and
said impact surface is defined by a portion of a revolvingly driven band.

4,445,682

ORIGINAL CIRCULATING AND CONVEYING DEVICE FOR COPYING MACHINE

Hiroyasu Uchida, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,615
Claims priority, application Japan, Jun. 8, 1981, 56-86912
Int. Cl.³ B65H *29/58*
U.S. Cl. 271—301 **5 Claims**



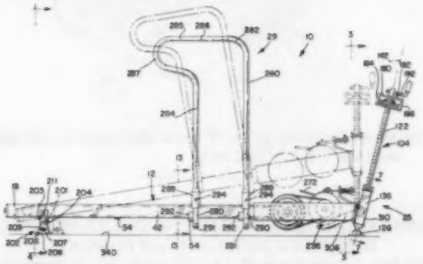
1. A recirculating document handling apparatus for a copying machine of the type wherein a plurality of copies of a document are obtained by repeatedly transporting said document past an exposure station until a desired number of exposures of said document have been made, said handling apparatus comprising:
conveying means for conveying a document from a document insertion position to a document discharge position along a conveying path past said exposure position;
detection means for detecting the size of said document; and
recirculating means for selectively recirculating said document back to said exposure station through a recirculation path before it reaches said discharge position until said desired number of copies have been made, said recirculating means being responsive to said measured document size to vary the length of said recirculation path, said recirculating means being disabled to thereby permit said document to be forwarded to said discharge position without recirculation after only one exposure has been made regardless of the number of exposures desired when said detection means detects that said document exceeds a predetermined size.

4,445,683

EXERCISE TREADMILL WITH ROCKABLE FEET

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

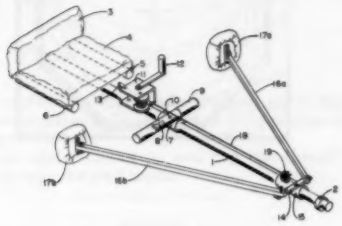
Continuation-in-part of Ser. No. 226,766, Jan. 21, 1981, Pat. No. 4,374,587, which is a continuation-in-part of Ser. No. 175,516, Aug. 5, 1980, Pat. No. 4,344,616. This application May 17, 1982, Ser. No. 378,627
Int. Cl.³ A63B *23/06*
U.S. Cl. 272—69 **9 Claims**



8. In an exercise treadmill including a generally planar slider bed having a head end, a tail end, and a top surfacing extending substantially between said ends thereof, an endless belt trained over said slider bed defining an upper belt run overlying said slider bed top surfacing and a lower run passing under said slider bed, means for driving said belt for movement of said belt upper run from said head end to said tail end of said slider bed, said slider bed having secured to same adjacent said head end thereof a cross member extending transversely thereof, a pair of screw members each defining a threaded portion that is threadedly mounted in said cross member in spaced apart relation and for rotation about upright axes that are in parallelism and that are at like acute angles with respect to the plane of said slider bed, with each of said screw members having a foot journaled thereon, and means for simultaneously rotating said screw members in the same direction in forward and reverse directions between retracted and extended positions thereof relative to said cross member for threading said cross member longitudinally of said screw members to raise and lower said slider bed head end,
the improvement wherein:
said slider bed has spaced rear feet adjacent its tail end that are rockably connected thereto,
said feet being proportioned to support said slider bed with said plane thereof horizontally disposed when said screw members are in their retracted positions relative to said cross member with the screw member threaded portions thereof being largely disposed above said cross member,
said screw member threaded portions being proportioned in length such that when said screw member threaded portions are in their extended positions relative to said cross member, with said screw member threaded portions thereof being largely disposed below said cross member, said slider bed is disposed at the acute angle that complements said acute angles, relative to the horizontal,
said screw members in their said retracted positions being at said acute angles relative to the horizontal and said screw

members in their said extended positions being substantially vertically disposed, and said rear feet being moved by said slider bed toward said feet of said screw members when said screw members are moved to their said extended positions, and said rear feet being moved by said slider bed away from said feet of said screw members when said screw members are moved to their said retracted positions.

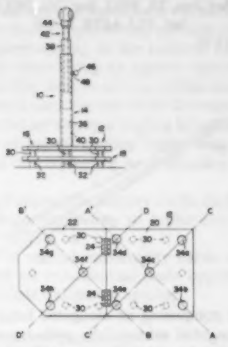
4,445,684
LEG STRETCHING MACHINE
Henry C. Ruff, One Crown St., Hyde Park, Mass. 02136
Filed Jul. 19, 1982, Ser. No. 399,475
Int. Cl.³ A63B *23/04, 21/12*
U.S. Cl. 272—134 **5 Claims**



1. A leg stretching machine comprising:
a shaft having a top side, a bottom side, a front end, and a back end;
a seat attached on the top side at the back end of the shaft;
a winch mounted on the shaft between the seat and the front end of the shaft;
a cross-bar having a pair of ends slideably mounted on the shaft between the winch and the front end of the shaft;
a flexible connecting means between the winch and the cross-bar;
a pair of rods each having two ends, one end of which is pivotally attached to the cross-bar; and
a pad means pivotally attached to the opposite end of each rod and each being adapted to engage a user's leg while seated on the machine whereby the user may operate the winch and draw the cross-bar toward him and thereby cause the pads to be forced against his legs.

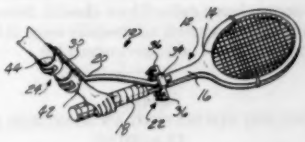
4,445,685
BATTING TEE
Edward J. Cardieri, P.O. Box 2393, St. Leo, Fla. 33574
Continuation-in-part of Ser. No. 259,256, Apr. 30, 1981, Pat. No. 4,383,686. This application Mar. 19, 1982, Ser. No. 359,699
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 R **8 Claims**

1. A batting tee comprising a base and a substantially vertical adjustable tee member including an elongated hollow interconnecting element having an upper tee element telescopingly disposed therein, and a substantially flexible ball support member attached to the upper portion of said upper tee element and an adjustment means to selectively lock said upper tee element in a predetermined position relative to said elongated hollow interconnecting element and a plurality of apertures comprising a predetermined pattern formed in said base to selectively receive said elongated hollow interconnecting element to vary the ball hitting position relative to the batting tee, said predetermined pattern comprises at least two pair of substantially parallel diagonal rows of apertures wherein said two pairs of diagonal substantially parallel rows are inclined relative to each other to permit the batter to hit inside, over the center and outside pitcher from either of two positions according to the hitter's position in the batter's box on either side of said batting tee, said base comprises an upper base member comprising a



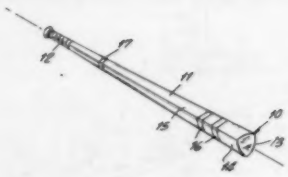
first and second base element hingedly coupled together normally disposed in co-planar relationship to each other.

4,445,686
TENNIS TEACHING DEVICE
James C. Daugherty, 2709 Cypress, Muncie, Ind. 47302
Filed Sep. 19, 1980, Ser. No. 188,933
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—29 A **10 Claims**



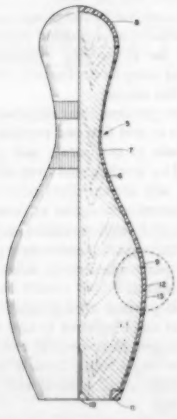
1. A tennis teaching device adapted to be removably secured to a tennis racket having a head portion, a throat portion and a hand grip comprising:
a substantially rigid strap having first and second end portions and an intermediate portion disposed between said first and second end portions;
first means for removably attaching said first end porion of said strap to said throat portion of said racket; and
second means for removably attaching said second end portion of said strap to the forearm of a player adjacent to the wrist of the player;
said intermediate portion being disposed at a predetermined angle relative to said first end portion along the longitudinal central axis of said strap, said predetermined angle being formed by bending said strap along said longitudinal central axis, said intermediate portion further being rotated a predetermined angular amount relative to said first end portion, said predetermined angular amount being formed by rotating said intermediate portion in a direction substantially perpendicular to said longitudinal central axis of said strap;
said second end portion of said strap being disposed at a predetermined angle relative to said intermediate portion along said longitudinal central axis of said strap, said predetermined angle being formed by bending said strap along said longitudinal central axis at another location along said strap;
said strap and said first and second attaching means cooperating to hold the forearm and the wrist of said player in a fixed position relative to said tennis racket throughout the stroke of said racket.

4,445,687
BASEBALL BAT
William H. Merritt, 350 First Ave., New York, N.Y. 10010
Filed Jun. 28, 1982, Ser. No. 392,386
Int. Cl.³ A63B 59/06
U.S. Cl. 273—72 R 4 Claims



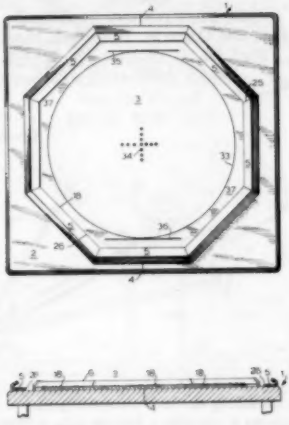
1. A ball bat comprising an elongated head portion at one end and an elongated substantially cylindrical handle at the other end; said head portion having a substantially triangular cross-sectional shape; said triangular cross-sectional shape comprised of a front arcuate ball striking face and two arcuate converging sides; said front arcuate ball striking face comprising a surface in the shape of a segment of a circle generated by a radius centered about a point substantially and rearwardly removed from the geometric center of the bat to provide a head portion having a ball striking surface of more gradual curvature than a conventional bat of circular cross-sectional shape and substantially the same cross-sectional area as said conventional bat of circular cross-section, said arcuate ball striking portion being defined by a chordal distance between the ends of the said segment substantially equal to the diameter of the head portion of said conventional bat.

4,445,688
BOWLING PIN HAVING AN IONOMER RESIN CLADDING
Fernando V. Frillici, Fairfield, Conn., and Joseph R. Infantino, Chappaqua, N.Y., assignors to AMF Incorporated, White Plains, N.Y.
Filed Apr. 4, 1978, Ser. No. 893,369
Int. Cl.³ A63D 9/00
U.S. Cl. 273—82 R 10 Claims



1. A bowling pin comprising a wood core encased in a plastic cladding composition comprising a resinous layer composed of an ionomer resin, said pin having improved break-in performance, exhibiting in use a relatively high initial scoring level.

4,445,689
MARBLE PLAYING COURT
Judson C. Rainey, 2501 Halsel St., Rte. 7, Gulfport, Miss. 39503
Filed Feb. 11, 1980, Ser. No. 120,647
Int. Cl.³ A63F 7/00
U.S. Cl. 273—118 R 15 Claims



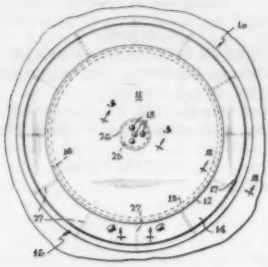
1. A marble playing court comprising:
a mat of a firm flexible material having a peripheral edge; and
a plurality of border members around the periphery of said mat, each border member having a base which has an upper surface at the inner edge thereof level with the upper surface of the mat at the periphery thereof and forming a continuation thereof and having an inner edge complementary in shape to and abutting a portion of the peripheral edge of said mat to define with said mat a marble playing surface, said marble playing surface having indicia for a marble game thereon, each border member further having an upwardly and inwardly extending marble blocking wall on the outer edge of said base, the ends of said border members abutting the ends of adjacent border members to form a frame completely enclosing the mat and having engaging means engaging complementary engaging means on the abutting ends of adjacent border members.

4,445,690
GAME APPARATUS
Frank D. Cairns, 3635 Artesia Blvd. #230, Torrance, Calif. 90504
Filed Feb. 22, 1982, Ser. No. 350,626
Int. Cl.³ A63F 7/00
U.S. Cl. 273—118 R 5 Claims

1. A game apparatus comprising a circular mat of plastic-like composition having a playing surface terminating in a circular peripheral edge;
a ring mat surrounding said circular mat having an outer barrier raised above said playing surface;
said barrier comprises a first and a second sheet of resilient material having opposite edges attached together;
said first sheet is of shorter width than the width of said second sheet so that an upwardly curved lip projects from said ring mat;
a plurality of rollable playing pieces adapted to be propelled across said playing surface;

a playing piece collection area defined on said ring mat between said circular mat peripheral edge and said outer barrier;

said circular mat and said ring mat of a composition characterized as being deformable and resilient and adapted to return to a substantially flat shape after deformation; and



said circular mat includes an edge marginal region adjacent said peripheral edge lapped over an inner portion of said ring mat; and

an annular spacer carried on said ring mat beneath said circular edge marginal region.

4,445,691

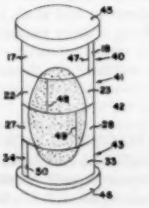
METHOD OF PRODUCING A PUZZLE

Martin H. Stark; George V. Pisani, both of Saginaw, and James J. Paquette, Bloomfield Hills, all of Mich., assignors to Arrow Paper Products Company, Saginaw, Mich.

Filed Sep. 29, 1982, Ser. No. 426,796

Int. Cl.³ A63F *9/08*

U.S. Cl. 273—155 **8 Claims**



1. A process of producing a puzzle comprising cutting a two-dimensional sheet bearing a selected design into a plurality of parallel strips; cutting each of a selected number of said strips transversely between its ends into at least two pieces; rearranging the pieces of each of said strips end-for-end to form a modified strip; forming each of said modified strips into an endless ring; and mounting each of said endless rings on a spindle for rotation independently of the remainder of said rings.

4,445,692

BOARD GAME INVOLVING INTERNATIONAL TRADE

Walter G. Boyle, 10 Centrepark Dr., Ottawa, Ontario, Canada (K1B 3C1)

Filed Mar. 2, 1982, Ser. No. 330,236

Int. Cl.³ H63F *3/00*

U.S. Cl. 273—256 **5 Claims**

1. In a board game,

a. a board having a playing surface;

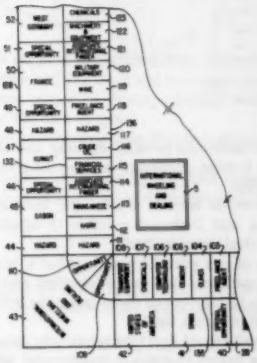
b. a plurality of playing spaces constituting a continuous path, said spaces having designations for various countries, commodities, financial services, special opportunities, international wheeling and dealing opportunities, hazards, free insurance, export-import tax, associate international finders, freelance agents and start;

c. a plurality of agency agreement cards, each of which displays the country, goods and services represented and coloring corresponding to the country locations on the game board, there being an agency agreement card for each commodity and/or service within each country on the board, each card also sets forth the cost of establishing the agency and setting up a trading house in that country;

d. a plurality of export enquiry cards, each of which has designations corresponding to a plurality of designated spaces;

e. a plurality of import file enquiry cards, each of which has designations corresponding to a plurality of designated spaces;

f. a plurality of special opportunity cards each of which displays data on international trade opportunities correlated to multiple designated spaces;



g. a plurality of wheeling and dealing opportunity cards each of which displays data on international trade opportunities correlated to multiple designated spaces;

h. a plurality of hazard cards, each of which displays data imposing penalties, both insurable and noninsurable, related to the many hazards and pitfalls of international trade;

i. a plurality of all risk insurance policy cards each of which displays data providing protection from all insurable risks of international trade and the cost of purchasing said insurance;

j. a plurality of playing pieces of different colors;

k. a plurality of agency agreement chips; a plurality of trading house flags;

m. a supply of playing money, and

n. chance device for determining the number of playing spaces over which a playing piece is moved.

4,445,693

BULLET TRAP

Richard B. Angwin, Oshkosh, Wis., assignor to Laminations Corporation, Neenah, Wis.

Filed Sep. 24, 1981, Ser. No. 305,189

Int. Cl.³ F41J *1/12*

U.S. Cl. 273—404 **19 Claims**

18. A portable bullet trap, comprising

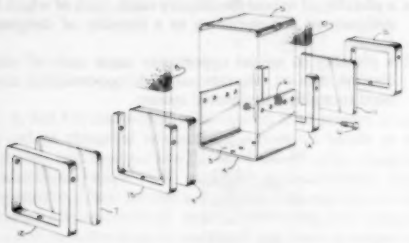
a portable housing of superimposed substantially coplanar plies of sheet-like paper joined by intervening adhesive forming a first rigid laminate tube having an internal wall forming a central opening along a tubular axis disposed generally in the direction of the line of fire,

a second rigid laminate tube of superimposed substantially

coplanar plies of sheet-like paper joined by intervening adhesive located at a first end of said housing opening and having an outer wall located adjacent to said internal wall of said first tube and a central opening aligned substantially along said tubular axis,

a first baffle of superimposed substantially coplanar plies of sheet-like paper joined by intervening adhesive forming a rigid laminate located within said housing opening and abutting said second tube to substantially enclose said central opening and permit the passage of the bullet therethough without shattering and splintering said first baffle,

a U-shaped member of superimposed substantially coplanar



plies of sheet-like housing opening and abutting said U-shaped bottom portion of said housing and abutting said first baffle,

a second baffle located within said housing opening and abutting said U-shaped member to substantially enclose said central opening, and

a column of pea gravel located within a cavity formed between said first and second baffles and said U-shaped member to engage and disintegrate the bullet after passing through said first baffle,

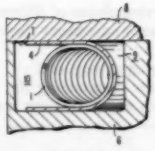
said top wall of said first tube selectively movable to remove said pea gravel to assist in transporting said trap without undue weight.

4,445,694

ALL-METAL EXPANDABLE ULTRA HIGH VACUUM SEAL

Robert Flaherty, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1982, Ser. No. 450,583
Int. Cl.³ F16J *15/02*
U.S. Cl. 277—1 **5 Claims**



5. A process for sealing against passage of a fluid between high and low pressure regions which comprises:

(a) forming a spring member composed of a shapememory alloy into an expanded shape at a temperature at which said alloy is austenitic and therefore remembers said shape;

(b) installing said spring member within an expandable wrapper;

(c) chilling said spring member to a temperature at which said alloy converts to a martensitic phase;

(d) compressing said spring member to a reduced size;

(e) installing said spring member between a first and a second flange surface; and

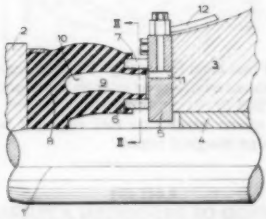
(f) warming said spring member to a temperature whereat said alloy converts back to the austenitic phase, remembers said expanded shape, and therefore elastically deforms the wrapper against said flange surfaces thereby sealing against fluid passage therebetween.

4,445,695

ROTARY MECHANICAL SEALS

Samuel C. Wilkinson, Chichester, England, assignor to Crane Packing Limited, Slough, England

Filed May 20, 1982, Ser. No. 380,467
Claims priority, application United Kingdom, Mar. 10, 1982, 8207021
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—65 **7 Claims**



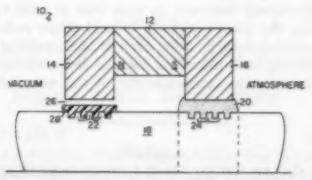
1. A rotary mechanical seal assembly for keeping apart two fluids comprising a rotatable shaft, a seat member and a mounting member both surrounding said shaft, said mounting member carrying a pair of spaced apart face seals in rubbing contact with said seat member and defining between them an annular void space, one of said seat and mounting members being rotatable with said shaft and the other of said members being stationary with respect to said shaft, passage means in one of said members defining a drain passage leading into said void space, and pumping means rotatable with the shaft to pump to said drain passage any fluid which enters said void space.

4,445,696

NONBURSTING MAGNETIC LIQUID SEALS FOR HIGH VACUUM APPLICATIONS

Kuldip Raj, Merrimack; Ronald Moskowitz, Hollis, and Raymond Rodier, Nashua, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Feb. 22, 1983, Ser. No. 468,339
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **14 Claims**



1. A single pole, ferrofluid magnetic seal apparatus adapted to provide a ferrofluid pressure-type seal about a shaft extending between a first low-pressure and a second high-pressure environment, which seal apparatus comprises:

(a) an annular permanent magnet having poles of opposite polarity and adapted to surround the shaft to be sealed;

(b) first and second magnetically permeable pole pieces, each having a one and another end, the one end of each

pole piece in a magnetic-flux relationship with the opposite poles of the permanent magnet, the other end of each pole piece adapted to extend into a close, noncontacting relationship with the surface of the shaft to be sealed, to define a radial gap at the end of each pole piece, the other end of the second pole piece forming, with the surface of the shaft to be sealed, a plurality of separate stages in the radial gap under the second pole piece;

(c) a ferrofluid retained in the radial gap under the second pole piece between the separate stages, the ferrofluid adapted to provide a plurality of separate O-ring ferrofluid seals about the surface of the shaft to be sealed in operation, and the radial gap under the other end of the first pole piece essentially free of ferrofluid; and

(d) the second pole piece adapted to be placed toward the high-pressure environment and the first pole piece adapted to be placed toward the low-pressure environment, and having a radial gap substantially less than the radial gap under the second pole piece,

thereby providing a single pole, ferrofluid, pressure-type seal apparatus having a reduced tendency to permit air bursts, when installed about the shaft and between the first low- and the second high-pressure environments.

4,445,697

COLLET

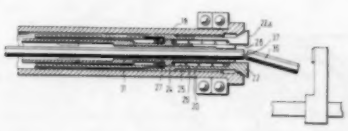
Richard F. Evans, Birmingham, England, assignor to Kenmar Export Ltd., Birmingham, England

Filed May 5, 1981, Ser. No. 260,714

Claims priority, application United Kingdom, May 9, 1980, 8015340

Int. Cl.³ B23B *5/22, 5/34*

U.S. Cl. 279—1 A **8 Claims**



1. In a collet for an automatic machine tool, said collet including a spindle having an internally tapered portion, and an outer sleeve having a bore therethrough within said spindle, said outer sleeve having an externally tapered portion cooperating with the internally tapered portion of said spindle, the invention comprising an inner sleeve axially reciprocable between a retracted and an extended position within the externally tapered portion of the outer sleeve during operation of the machine tool, the inner sleeve being clamped in the outer sleeve when said inner sleeve is in its extended position and means for moving said inner sleeve to its axially retracted position during bar stock feeding, the arrangement being such that bar stock when clamped in the collet is clamped by the inner sleeve which is clamped in the bore of the tapered portion of said externally tapered portion of the outer sleeve and short bar stock ends are free to fall from the inner sleeve in its retracted position.

4,445,698

ROLLER SKATE WITH USER POWERED DRIVE MECHANISM

James R. Stillwell, 3069 W. 16th Ave., Vancouver, British Columbia, Canada

Filed Jan. 5, 1982, Ser. No. 337,111

Int. Cl.³ A63C *17/12*

U.S. Cl. 280—11.115 **5 Claims**

1. A skate adapted to derive motive power from the body weight of the user imposed thereon, comprising:

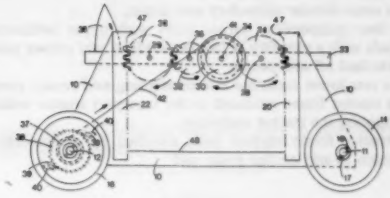
(a) a frame having axles and ground engaging wheels thereon, at least one of the wheels being a driving wheel,

(b) a foot support, adapted to hold one of the user's feet,

(c) a pair of front racks and a pair of rear racks, the racks of a pair being vertically connected to the frame and spaced apart transversely from the longitudinal axis of the frame,

(d) a pair of front gears rigidly connected to a front shaft, and a pair of rear gears rigidly connected to a rear shaft, the front and rear shafts being rotatably connected to the foot support, and the front and rear gears being adapted to mesh with the front and rear racks respectively,

(e) intermediate gears rotatably connected to the foot support and adapted to mesh with the front and rear gears so



that the foot support is maintained in a pre-determined support position and the front and rear gears are rotating in an opposite direction during vertical reciprocating movement of the foot support,

(f) driving means cooperating with the gears and each driven wheel,

(g) restoring means for returning the foot support to its upward position after release of the downward pressure of the foot.

4,445,699

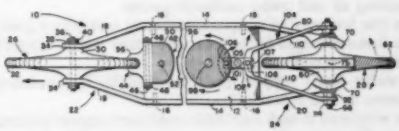
COASTER AND SWIVEL ASSEMBLY THEREFOR

Edward Daraskо, 30 Northfield Rd. Apt. 211, Bedford, Ohio 44146

Filed Oct. 9, 1981, Ser. No. 309,928

Int. Cl.³ B62M *1/00*

U.S. Cl. 280—87.04 R **17 Claims**



1. A coaster comprising a foot platform, front and rear platform supporting wheels mounted on said platform for rotation about their respective rotational axes, one of said wheels further being mounted on said platform for pivotal steering movement, a foot steerable member supported on said platform for pivotal movement about a vertical axis, and linkage means connected to said foot steerable member and connected to said one of said wheels for effecting pivotal steering movement of said one of said wheels in response to pivoting of said foot steerable member.

4,445,700

HIGHWAY TRANSPORT TRUCK TIRE WATER SPLASH SHIELD

Warren C. Schroeder, 200 Cambridge Dr., Hagerstown, Md. 21740

Filed Oct. 23, 1981, Ser. No. 314,220

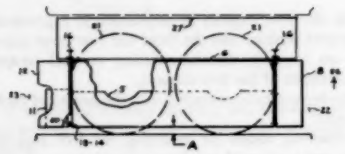
Int. Cl.³ B62D *25/16*

U.S. Cl. 280—154.5 R **17 Claims**

1. A highway transport truck tire water splash shield for each group of two or more dual wheels of a transport tractor and each group of two or more dual wheels of a transport trailer connected to said tractor; said wheels mounted with

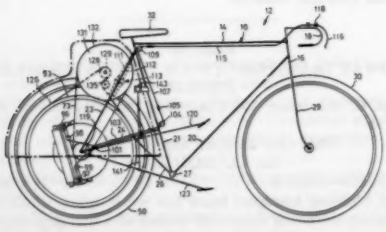
pneumatic tire communicating with a road bed, said tractor and trailer each equipped with encompassing structures forming removable enclosures with holes introducing an airflow through, disrupting the encased enclosure atmosphere reducing wheel water throw and splash, which comprises a tractor enclosure including:

(a) a straight front panel;
(b) a straight outside panel;
(c) a straight inside panel;
(d) a straight upper rear panel;
(e) a semi-circular rear panel;
(f) a semi-circular secondary rear panel;
(g) four independent corner posts with upper horizontal pads with a plurality of captive studs in said corner posts attached all said panels;
(h) a rear lower cross bar interconnecting said corner posts;
(i) a tractor frame mounted to the transport tractor which supports the tractor enclosure;
(j) tractor frame support pads attached by a connecting means to said corner posts; and



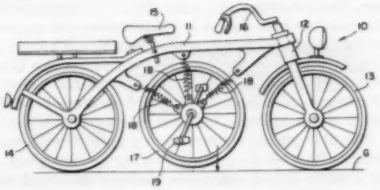
(k) a wing stud in each said tractor enclosure support pad and securing said corner post; and a trailer enclosure including:
(l) a semi-circular front panel;
(m) a straight outside panel;
(n) a straight inside panel;
(o) a semi-circular rear panel;
(p) a semi-circular lower secondary rear panel;
(q) four independent corner posts and upper horizontal pads with a plurality of captive studs in said corner posts attaching all said trailer enclosure panels;
(r) a rear lower cross bar interconnecting said corner posts;
(s) a frame mounted to the transport trailer which supports each trailer encosure;
(t) trailer frame support pads attached by a connecting means to said corner posts;
(u) a wing stud in each said trailer enclosure support pad and securing said corner post.

4,445,701
VEHICLE STRUCTURE
Edward A. Stroud, Toronto, Canada, assignor to Stroudex Industries Inc., Brampton, Canada
Filed Dec. 14, 1981, Ser. No. 330,707
Int. Cl.³ B62M *1/10*
U.S. Cl. 280—217 **10 Claims**



1. A vehicle comprising:
a frame,
a steerable wheel mounted on said frame,
two coaxial rear wheels mounted for free rotation in spaced-apart relation on said frame,
a flywheel mounted for rotation between said coaxial rear wheels,
means for imparting rotation to said flywheel,
a clutch plate rotatably mounted outwardly adjacent at least one rear wheel and coaxial therewith,
speed-change means for allowing rotation of the flywheel to rotate the clutch plate at a faster rate than said flywheel, said speed-change means including a freely turning first pulley wheel mounted for rotation about an axis beyond the rim of the rear wheels, the first pulley wheel being fixed with respect to a second pulley wheel of smaller diameter which turns therewith, first endless drive means entrained around said flywheel and said second pulley wheel, and second endless drive means entrained around said first pulley wheel and a small-diameter portion of a clutch plate assembly of which said clutch plate is a part,
and frictionless clutch means between the clutch plate and said at least one rear wheel.

4,445,702
SUPER BIKE
Daniel Reyes, 233 Broadway, Room 3615, New York, N.Y. 10007
Filed Nov. 23, 1981, Ser. No. 324,049
Int. Cl.³ B62K *5/02*
U.S. Cl. 280—239 **1 Claim**

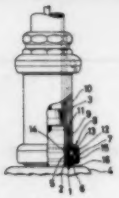


1. An improved super bike, comprising in combination, a bicycle having a frame, a fork, a front wheel supporting said fork, a rear wheel supporting a rear end of said frame, a third wheel carried by said frame and located between said front and rear wheels in combination with means mounted on said frame supporting said third wheel spaced from the ground, in further combination with pedals on said third wheel, a rider's seat on said frame, and a handle bar on said fork whereby the rider's weight on said third wheel pedals causes ground engagement.

4,445,703
HEAD SET ARRANGEMENT FOR BICYCLE
Michiaki Tange, Osaka, Japan, assignor to Maruí Ltd., Hyogo, Japan
Filed Jul. 8, 1982, Ser. No. 396,436
Claims priority, application Japan, Oct. 16, 1981, 56-154475[U]
Int. Cl.³ B62K *21/06*
U.S. Cl. 280—279 **7 Claims**

7. A head set arrangement for a bicycle, comprising a crown ball race inserted, through its central bore, over a fork stem and fixed to the upper part of a fork crown, and provided with an annular semi-circular groove in its outer periphery close to its bottom, a circular ring formed of synthetic rubber fitted into said groove, a bottom ball head cup formed of a light alloy, rotatably inserted over said fork stem through its central bore, and provided with an annular semi-circular groove in its inner periphery close to its bottom, an annular track member dis-

posed within said bottom ball head cup, and a bearing ball interposed between the said crown ball race and said track



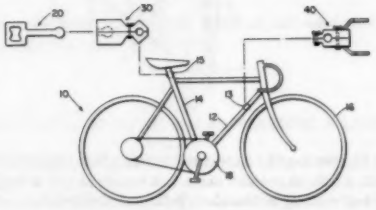
member, said circular ring being placed in the second-mentioned annular groove with a slight gap therebetween.

4,445,704

CONTROL ASSEMBLY FOR BICYCLES

A. Ray Troxler, 4801 Summit Ave., Greensboro, N.C. 47205

Filed Nov. 20, 1981, Ser. No. 323,308
Int. Cl.³ B62K *21/00, 21/10*
U.S. Cl. 280—292 **8 Claims**



1. In a two-wheel cycle having a forward steering wheel and a rear wheel and a pedal assembly located between said wheels, a control assembly mounted on said cycle enabling an ambulant person to push the cycle and maintain its stability when in motion, comprising:

means removeably attachable to said cycle for directly transferring momentum imparted to said cycle by the ambulant person,

and means for restraining pivotal movement of said steering wheel, said restraining means comprising opposing arm means for capturing a portion of said steering wheel therebetween, said arm means being pivotable between a first operative position wherein said steering wheel portion is captured therebetween, and a second inoperative position wherein said arm means are pivoted rearwardly of said first position and lateral movement of said steering wheel is unrestrained.

4,445,705

STAND DEVICE FOR TWO-WHEELED VEHICLES

Tsutomu Hayashi, Tokyo, and Akira Shigihara, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,359
Claims priority, application Japan, Jun. 30, 1981, 56-102514
Int. Cl.³ B62H *1/02*
U.S. Cl. 280—302 **5 Claims**

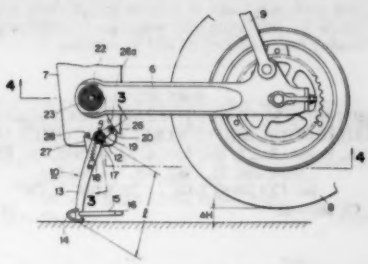
1. A stand device for two-wheeled vehicles, comprising:

a vehicle body frame;

a main stand member pivotally connected at a base end thereof to said vehicle body frame;

a rear wheel support member pivotally connected at a base end thereof to said vehicle body frame; and

urging means for moving said rear wheel support member pivotally upwardly in response to a pivotal downward movement of said main stand member, said urging means



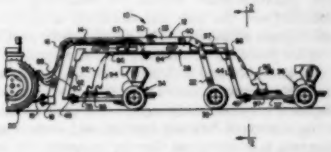
being disposed between said main stand member and said rear wheel support member.

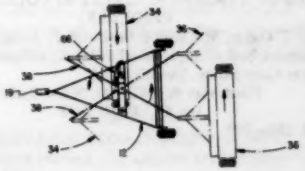
4,445,706

TANDEM HITCH APPARATUS

James P. Jarosek, Rte. 1, Box 326, Waco, Tex. 76710

Filed Mar. 11, 1982, Ser. No. 357,197
Int. Cl.³ B62D *53/00*; B60D *1/00*
U.S. Cl. 280—411 C **12 Claims**





1. A hitch apparatus for towing first and second implements spaced apart behind a towing vehicle in a laterally spaced echelon working formation and in a generally in-line tandem transport formation, said apparatus comprising:

an elongated frame including a tongue part at one end of said frame for connecting said apparatus to said towing vehicle, and ground engaging support wheel means disposed at the opposite end of said frame, said frame being normally supported generally above and bridging over said first implement and with said support wheel means being disposed between said first and second implements;

implement drawbar means comprising an elongated beam pivotally connected to said frame by pivot means on said beam between opposite ends of said beam, said beam including a pair of spaced apart hitch points on opposite sides of said pivot means for connecting said first implement and said second implement to said drawbar means, respectively, for towing said implements by said drawbar means;

actuator means connected to said drawbar means and said frame for pivotally moving said drawbar means to move

said first and second implements between respective laterally spaced positions in said working formation and substantially in-line tandem positions in said transport formation; and bearing support means on said frame and engageable with said beam at a point spaced from said pivot means for supporting said beam against deflection due to towing forces exerted on said implements.

4,445,707

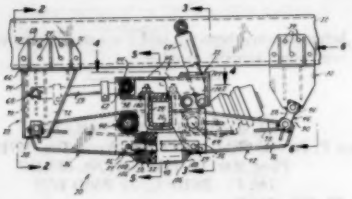
SUSPENSION SYSTEM WITH PARALLELOGRAM AXLE STABILIZATION AND CENTRAL ELASTOMER SPRING

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed Jan. 21, 1982, Ser. No. 341,565

Int. Cl.³ B60G *5/00, 11/26;* **B10K** *23/00*

U.S. Cl. 280—687 **24 Claims**



1. A vehicle suspension to support a chassis from at least one axle having an axle seat assembly for mounting the axle to the suspension, parallelogram means for extending between a chassis member and the axle seat assembly to stabilize same, said parallelogram means including a first torque arm, a second torque arm for pivotally connecting to and extending between the axle seat assembly and a chassis member, said torque arms being mounted in opposition to each other, and a central spring means disposed between said torque arms, each of said torque arms having a surface bearing against said central spring so that said spring is compressed thereby to resist axle loading.

4,445,708

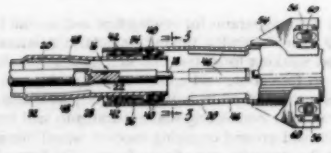
ENERGY ABSORBING STEERING COLUMN FOR VEHICLES

Edmond G. Oakes, St. Charles; Frederick P. Arndt, and Leonard F. Grandel, both of Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 9, 1983, Ser. No. 492,606

Int. Cl.³ B62D *1/18*

U.S. Cl. 280—777 **3 Claims**



1. An energy absorbing steering column assembly for a vehicle having steerable road wheels comprising a pair of telescopically related mast jacket tubes having a plurality of balls adapted to roll between the walls of the tube during telescopic movement thereof and to plastically deform and form grooves in such walls in a first stage of energy absorption, the improvement comprising first ramp means operatively engaged by a predetermined complement of said balls after predetermined telescopic travel of said column to increase the energy absorbing capacity of said column in a second stage of energy absorption and second ramp means in another of said tubes subsequently operatively engaged by a second complement of said balls to further progressively increase the rate of energy absorption as said tubes relatively move toward the maximum telescoped position in a third stage of energy absorption.

4,445,709

THREE-POINT SAFETY BELT SYSTEM

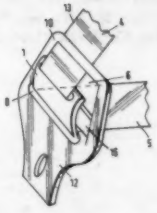
Alois Bost, Leopoldstr. 102, D-6685 Schiffweiler 2, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 393,770, Jun. 30, 1982. This application Dec. 10, 1982, Ser. No. 448,606

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215634

Int. Cl.³ A62B *35/00*

U.S. Cl. 280—801 **19 Claims**



1. In a three-point motorvehicle safety belt apparatus having a belt, a belt takeup unit and a belt runner at which lengths of said belt running across the hips and across the chest of a belt user come together, said runner being designed for gripping onto said belt and keeping its position between said chest and hip lengths of said belt, the invention residing in that said runner has an eye through which said belt is threaded, and a cross-bar on one side of said eye, said apparatus furthermore, having a belt guidepiece, said belt guidepiece comprising two eyes through which said belt is threaded, the two guidepiece eyes being placed on two sides of said cross-bar, a projection means formed on said guidepiece parallel to said eyes, said projection means engaging said runner to limit the relative movement of said guidepiece with respect to said runner, said guidepiece having a handle by which it may be turned in relation to said cross-bar.

4,445,710

MULTISHEET BINDER AND ASSEMBLY

Pierre Borel, Saint Martin d'Heres, France, assignor to Jowa, Grenoble, France

Filed Sep. 28, 1982, Ser. No. 425,864

Int. Cl.³ B42D *17/00;* **B42F** *11/00*

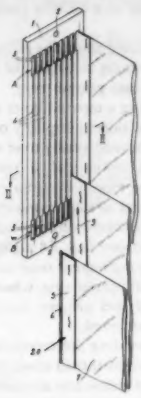
U.S. Cl. 281—45 **6 Claims**

1. A binding for retaining a plurality of flat members comprising:

an elongated support formed with a plurality of longitudinally extending throughgoing slots in a spaced-apart parallel relationship and each closed at both opposite ends, each of said slots having an enlargement at one end thereof with a width greater than the width of an adjacent portion of the respective slot and a length less than that of the slot, each of said enlargements constituting a window in said support; and

a longitudinally extending bead formed on an edge of each of

said members and insertable through a respective window whereby said bead underlies the respective slot, said bead



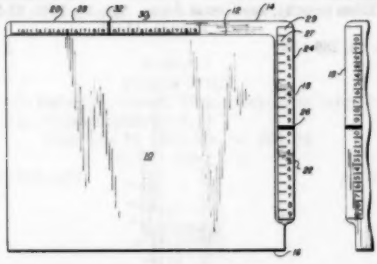
having a thickness less than the width of said window but greater than the width of said slot.

4,445,711

COLOR-CODED NUMERIC OR ALPHABETIC FILING SYSTEM

Walter F. Cunningham, 1370 W. Hampton Pl., Palatine, Ill. 60067

Filed Oct. 2, 1980, Ser. No. 193,438
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—1 R **26 Claims**



1. A document to be uniquely identified for filing and retrieval, said document being adapted for use with colored marker tabs having filing characters thereon in a first position, said document having a front surface and a back surface and a top edge and side edge, and said front surface having an elongated filing character field adjacent said top edge and a side edge and sequential filing characters being positively applied along the top edge and side edge in each of said fields, and said back surface having a filing character field associated with the same side edge as the field on the front surface, and sequential filing characters being positively applied along the side edge in said field;

the filing characters in all fields being arranged to cooperate with a marker tab to form a two-character code with the character on the document being in the second position of the code; and

wherein the field on the front surface, along the top edge extends inwardly from the edge at least two character heights;

the field on the front surface along the side edge extends inwardly of said edge at least two character widths; and

said field on the back surface along the side edge extends inwardly at least two character heights;

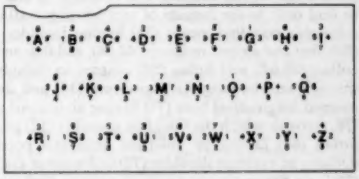
whereby the filing characters on a marker tab can be cooperatively and selectively positioned on said document along a top or side edge to define a two-character filing code.

4,445,712

IDENTIFICATION DEVICES AND METHODS

Edward A. Smagala-Romanoff, Palm Springs, Calif., assignor to ID Code Industries, Inc., Palm Springs, Calif.

Continuation of Ser. No. 111,908, Jan. 14, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,297
Int. Cl.³ B42D *15/00*; **G06K** *19/06*
U.S. Cl. 283—75 **7 Claims**



1. A method of establishing the identity of an unknown client at a subscriber location comprising the steps of:

first, providing the client with a personal positional code consisting of a sequence of a plurality of letters of the alphabet, each of which locates a digit of a multi-digit number establishing the identity of the client;

thereafter, at a subscriber location, presenting the client one of a multiplicity of different grids of digits in which each digit is positionally associated with a letter of the alphabet;

obtaining a first response providing a pre-determined form of identification from the client;

receiving from the client a second response consisting of a multi digit number from the grid as derived from his previously obtained personal positional code; and

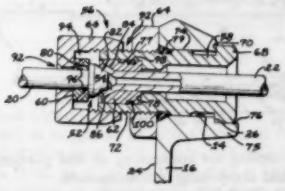
verifying the identity of the client by comparing the identification and number obtained from the client against a register.

4,445,713

BULKHEAD-FLUID-LINE CONNECTOR

E. Eugene Bruning, Normal, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 19, 1982, Ser. No. 399,626
Int. Cl.³ F02B *77/00*; **F16L** *5/02*
U.S. Cl. 285—14 **2 Claims**



1. A bulkhead-fluid-line connector (**10**) for joining and supporting a tubular fluid line assembly (**12**) adapted for passing through an aperature (**14**) of a housing wall (**16**), said housing wall (**16**) having outside and inside surfaces (**24,26**), said fluid line assembly (**12**) including first and second fluid lines (**20,22**), said bulkhead-fluid-line connector (**10**) comprising:

an enlarged end portion (**52**) integrally formed on the first

line (20) and having an externally disposed and frusto-conically shaped end surface (82);

another enlarged end portion (54) integrally formed on the second line (22) and having an internally disposed and frusto-conically shaped end surface (86) which is sealedly matedly complementarity with respect to said end surface (82) of the first line (20); and

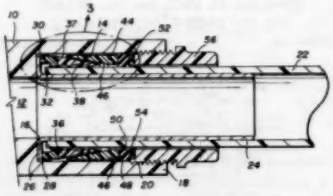
means (56) for releasably coupling said complementary end surfaces (82,86) of the fluid line end portions (52,54) in direct surface-to-surface sealed contact and thereby solely creating a single fluid path joint between the first and second fluid lines (20,22) generally where the fluid line assembly (12) is adapted to pass through the housing wall aperature (14), wherein said releasable coupling means (56) includes a fluid leakage path (92) extending adjacent the single joint of the sealedly contacting fluid line end surfaces (82,86) and adapted to be sealed from said inside surface (26) of the housing wall (16) and further adapted to lead only to the outside of said housing wall (16) said releasable coupling means (56) further includes a fitting (58), first and second retainers (64,66), and first and second collars (60,62), said fitting (58) adapted to slidably extend through said housing wall aperature (14) and defining a stepped longitudinal bore (77) having an internal shoulder (78) through which the fluid line assembly (12) passes, said fitting (58) having an enlarged head end portion (68) defining an external shoulder (70) and another end portion (72), said fitting shoulder (70) adapted to abut one of said inside or outside housing wall surfaces (26,24), said first retainer (64) releasably connected to said another end portion (72) of the fitting (58) and adapted to abut said other of the inside or outside housing wall surfaces (26,24), said second retainer (66) also releasably connected to said another end portion (72) of the fitting (58) and releasably coupling said complementary end surfaces (82,86) of the fluid line end portions (52,54) in direct surface-to-surface sealed contact, said second collar (62) sealedly positioned in said fitting bore (77) against said internal shoulder (78) of the fitting (58) and abutting said second line another end portion (54), said first collar (60) positioned between said first line end portion (52) and said second retainer (66).

4,445,714

COMPRESSION END PIPE COUPLING FOR PLASTIC PIPE

Stanley C. Kisiel, III, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 25, 1982, Ser. No. 361,326
Int. Cl.³ F16L 55/00
U.S. Cl. 285—23 **3 Claims**



1. A pipe coupling for connecting an end portion of non-metallic pipe and comprising in combination:

(a) a tubular body defining a central flow passage and including a counterbore communicating with said flow passage, said counterbore extending from a shoulder internal of the body to a distal end of the body for receiving the end of non-metallic pipe to be coupled;

(b) a tubular stiffener within said counterbore having an outwardly extending flange engaging said shoulder and sized to receive the pipe end in a slip fit thereover;

(c) an annular gripper ring having a toothed inner periphery and a tapered outer periphery arranged to surround the received pipe end and adapted to collapse inwardly in a toothed penetration gripping engagement of the pipe periphery in response to a radially inward force imposed thereon;

(d) a spacer ring positioned about the received pipe end at an axial location intervening between the inside face of said stiffener flange and said gripper ring;

(e) a locking ring having a tapered inner surface adapted to surround the tapered outer periphery of said gripper ring and effective when moved axially over said gripper ring in a ramping relation to impose a radial inward force thereon, said locking ring having an outer diameter less than the inner diameter of said counterbore so as to define a radial clearance therebetween and being axially dimensioned for its inward end face to engage and be arrested against further axial movement over said gripper ring by the back face of said spacer ring when a predetermined tooth penetration of said gripper ring into the received pipe end has been achieved;

(f) gasket means surrounding the received pipe end; and

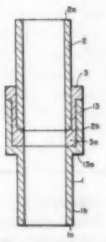
(g) nut means operative to thread inwardly of said body to compress said gasket means and displace said locking ring axially over said gripping ring in a ramp forced relation until the inward end face of said locking ring engages the back face of said spacer ring.

4,445,715

INSULATED JOINT AND METHOD FOR PRODUCING SAME

Takeo Inoue, and Takashi Shirazawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,778
Claims priority, application Japan, Apr. 14, 1980, 55-51151
Int. Cl.³ F16L 11/12
U.S. Cl. 285—54 **2 Claims**

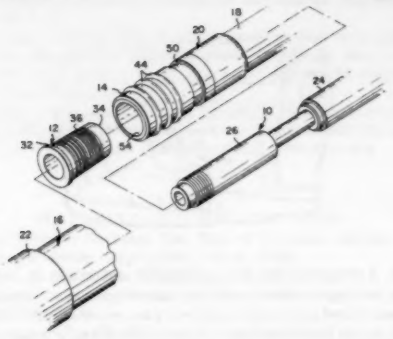


1. An insulated joint comprising: a first tubular member provided at one end of a cylindrical body with an outer circumferential portion having a larger internal diameter than the external diameter of said cylindrical body; a second tubular member having the same internal and external diameters as those of said cylindrical body of said first tubular member and fitted in said outer circumferential portion of said first tubular member with a gap therebetween; and an insulating member disposed in said gap hermetically coupling said first and second tubular members while insulating said first and second tubular members from each other wherein said insulating member comprises a glass-mica body molded in situ by the application of heat and pressure and formed from glass and mica powders with the glass powders constituting 30–50 percent of the powders by volume and wherein said glass powders are comprised of 1.0 molar part PbO, 0.4 molar parts B_2O_3, 0.4 molar parts SiO_2, and 0.2 molar parts AlF_3.

4,445,716
DEVICE AND METHOD FOR ANCHORING AN END OF A PLASTIC LINER INSIDE A PIPE

Joseph W. Hoffman, Liverpool, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1982, Ser. No. 371,831
Int. Cl.[3] F16L 9/14, 55/00
U.S. Cl. 285—55 4 Claims



1. A device for anchoring an end of a plastic liner to the inside surface of a pipe, the device comprising:

a. an elongated sleeve having first and second ends and a passage therethrough;

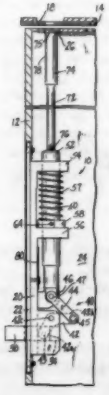
b. means for attaching a plastic liner to the second end of the sleeve; and

c. a hollow rigid tube with a tapered outer surface having teeth thereon for being forced into the passage at the first end of the sleeve to expand that end against the inside surface of a pipe in which the sleeve may be positioned and with the teeth biting into the passage wall to hold the tube in the passage.

4,445,717
FLUSH BOLT

William B. Imhoff, Springdale, Conn., assignor to Leigh Products, Inc., Grand Rapids, Mich.

Filed May 18, 1981, Ser. No. 264,358
Int. Cl.[3] E05C 1/02
U.S. Cl. 292—177 6 Claims



1. A flush bolt mechanism for use in conjunction with a pair of doors having free adjacent vertical edges when closed, said mechanism adapted to be mounted on one door substantially flush with the vertical edge thereof and to project a bolt from a horizontal edge of said door, said mechanism comprising:

a housing,

said housing defining first and second vertically spaced apart guide means,

a bolt assembly comprising a tubular member received in said guide means for vertical movement between a retracted position and an extended position, a bolt extending from said tubular member,

a trigger member slidably received in said housing and movable substantially perpendicular to said tubular member,

a drive member within said tubular member,

a first spring disposed within said tubular member between said bolt and said drive member and acting to transmit movement of said drive member to said tubular member,

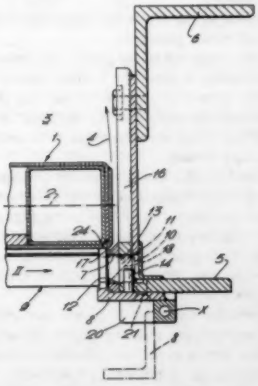
a drive linkage directly connecting said trigger member to said drive member whereby movement of said trigger member inwardly of said housing extends said bolt assembly, said drive linkage comprising a first link having first and second ends and pivotally connected to said trigger at a first end thereof and pivotally connected to said housing intermediate the ends thereof, a second link connected at one end thereof to said drive member and connected at the other end thereof to said second end of said first link, and

a second spring disposed about said tubular member acting on one of said guide means and biasing said bolt assembly towards a retracted position.

4,445,718
SECURITY DOORS

Brian Nuttall, Sheriffhales, and Charles F. Laxson, Tettenhall, both of England, assignors to Chubb & Son's Lock and Safe Company, London, England

Filed Mar. 29, 1982, Ser. No. 362,820
Claims priority, application United Kingdom, Apr. 22, 1981, 8112476
Int. Cl.[3] E05C 13/00
U.S. Cl. 292—341.17 4 Claims



1. A door arrangement comprising: a door frame; a security door which is hinged in relation to the said frame by hinge means adapted to permit the door to open both inwards to, and outwards from, an area which the door is adapted to close; abutment means associated with the door frame arranged normally to prevent the outward opening of the door, said abutment means being secured by releasable fastening means which are accessible only from outside said area, and are so accessible when the door is closed, whereby release of said fastening means permits the door to be opened outwardly when unlocked if the inward opening path of the door becomes blocked; and a lock for selectively locking the door to the frame, which normally is operable to unlock the door only

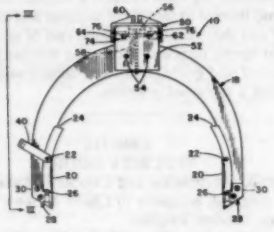
from outside said area and which can retain the door in engagement with the frame to resist opening of the door in both directions in the absence of said abutment means.

4,445,719

RELEASE MECHANISM FOR A CYLINDRICAL OBJECT RECOVERY DEVICE

Donald Miller, Del Mar, and Clark A. Bowers, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1981, Ser. No. 298,712
Int. Cl.[3] B66C 1/66
U.S. Cl. 294—88 8 Claims



1. A release mechanism for a structural memuer which has top and bottom sides comprising:

a block which is attachable to the structural member so as to extend thereabove;

a piston mounted in the block and movable vertically between up and down positions;

at least one rod connected to the piston and extending vertically downwardly beyond the bottom side of the structural member so as to be capable of moving the piston to the upward position when forcibly engaged by the object;

a U-shaped holder fitted over the block with each leg of the holder having a recess;

a pair of pistons laterally mounted in the U-shaped block in an opposing relationship and movable between inward and outward positions, the pistons being engageable with the holder within the recesses in the outward positions for retaining the U-shaped holder to the block, and clearing the recesses in the inward positions to release the U-shaped holder from the block;

a rod connected to each lateral piston and extending inwardly for engagement and disengagement with the edge of the vertical piston as the vertical piston moves from its down position to its up position, respectively;

means spring biasing the lateral pistons toward the inward positions; and

each rod maintaining the respective lateral piston in its outward holder engaging position when the lateral piston rod is in engagement with the vertical piston, and allowing the lateral piston to be spring biased to its inward disengaged position with respect to the holder when the lateral piston rod is disengaged from the vertical piston;

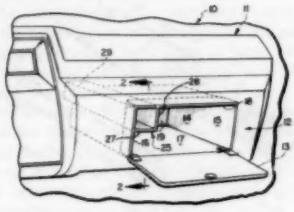
whereby upon the object forcibly engaging the bottom of the vertical rod the vertical piston will move upwardly to allow the lateral pistons to move inwardly and release the U-shaped holder from the block and the structural member.

4,445,720

UMBRELLA STORAGE TUBE IN AUTOMOBILE DASHBOARD

Sallie Leaf, 364 Charal La., Highland Park, Ill. 60035, and Arnold E. Rubin, 9217 Keystone Ave., Skokie, Ill. 60076

Filed Jul. 26, 1982, Ser. No. 402,050
Int. Cl.[3] B60R 7/06
U.S. Cl. 296—37.12 5 Claims



1. A storage device for a collapsible umbrella in an automobile having a compartment permanently mounted in a dashboard of said automobile and having an openable door controlling access from inside said automobile into said compartment, said device comprising:

an elongated tube having internal dimensions sufficient to closely enclose said umbrella in a collapsed configuration, the tube being substantially closed at one end and open at an opposite end;

said tube being permanently mounted in said compartment of said automobile and concealed behind said door and in a position slightly downwardly-inclined from the open end to the closed end; and

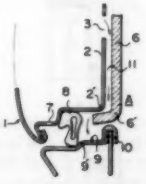
water disposal means for passing liquid collected from the tube to a disposal zone.

4,445,721

DRAINING MECHANISM FOR AUTOMOTIVE DOOR

Kouichi Yaotani, Tokyo, and Yasuyuki Ogawa, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd. and Kato Hatsujo Kaisha Ltd., both of Yokohama, Japan

Filed Nov. 19, 1981, Ser. No. 322,957
Claims priority, application Japan, Nov. 19, 1980, 55-165898[U]
Int. Cl.[3] B60J 5/04
U.S. Cl. 296—154 10 Claims



1. A vehicle door structure comprising:

(1) an exterior side panel,

(2) an interior side panel having aperture sections therethrough for receiving, for example, window and lock mechanisms,

(3) means for spacedly connecting said exterior and interior panels together along their lower ends thereby defining a space therebetween,

(4) a weather strip member attached to said connecting means and extended to contact a portion of a doorway of said door, thereby forming a water barrier between said connecting means and said doorway,

(5) a decorative plate spacedly disposed interiorly of said interior panel and defining a gap therebetween,

(6) said decorative plate having a lower end portion bent outwardly, toward said weather strip member and disposed between said connecting means and said doorway for channeling water passing through said aperture section and said gap to a region between said connecting means and doorway and adjacent said weather strip member, and

(7) drain means provided adjacent said weather strip member for draining water channeled thereto by said bent, lower end portion of said decorative plate to the exterior of said door structure

whereby water passing through said aperture sections and gap is channeled outside of the area defined between said interior and exterior panels and exteriorly of said door structure.

4,445,722

SEAT BELT LATCH FOR REAR SEATS

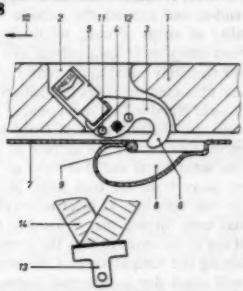
Dieter Schaper, Nauheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1982, Ser. No. 346,487

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110689

Int. Cl.³ B60R *21/00*; A47D *15/00*

U.S. Cl. 297—468 **7 Claims**



1. A safety belt arrangement for the rear seat of motor vehicles whose seat cushion and seat cushion frame of the seat bottom can be folded upwards relative the vehicle floor about a front edge, wherein for every kind of safety belt, the seat cushion has an opening for a belt buckle connected to the vehicle floor and with which there may be coupled a lock plate attached with a belt; characterized in that the belt buckle is arranged on one arm of a two-armed lever pivotally arranged on the seat cushion frame, which lever is provided at its other arm with a coupling member, and that the vehicle floor has an anchoring component and that between the seat cushion and the lever there is an actuating mechanism through which, during depression of the seat cushion by the occupant weight sitting thereon swings the lever into an anchoring position in which the coupling member automatically connects up with the anchoring component and when the occupant weight is removed from the seat cushion automatically disconnects the coupling member from the anchoring component.

4,445,723

METHOD OF CIRCLE MINING OF ORE

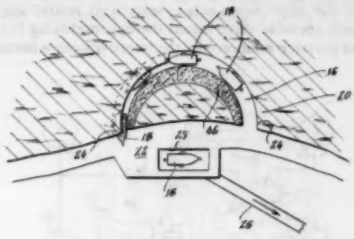
Paul D. McQuade, 147 Woodside Dr., Greenwich, Conn. 06830

Filed Jul. 26, 1982, Ser. No. 402,093

Int. Cl.³ E21C *41/00*

U.S. Cl. 299—11 **5 Claims**

1. A method of deep mining ore comprising laterally cutting a curvilinear, advancing passageway against the continuous face of the mine in a mountain by implements on a vehicle traveling in one direction, providing a work area adjacent to the portals of said passageway at the entrance and exit thereof whereby said vehicle traverses a substantially circular path partially within the passageway in said mountain and partially outside of said mountain over said work area, and said implements on said vehicle being adapted to cut ore from the rock formation on one side wall of said passageway, and means to



pack the excavated loose rock on the opposite retreating wall to form a support for the roof of the mine, when needed.

4,445,724

CUTTER-LOADER APPARATUS HAVING OVERHUNG SHEARER DRUM

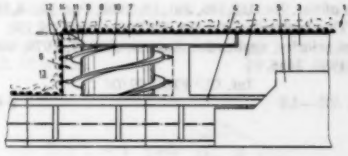
Hans Gröger, Essen-Stelle-Horst, and Ernst E. Harms, Hattingen, both of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH, Bochum, Fed. Rep. of Germany

Filed Sep. 25, 1981, Ser. No. 305,442

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3036981

Int. Cl.³ E21C *25/60*

U.S. Cl. 299—81 **4 Claims**



1. In a drum cutter-loader and face conveyor mining apparatus having an overhung shearer drum rotatable about an axis parallel to the floor, said drum being mounted on a support arm and having helical whorls for removing loosened spoil from a mining area to the said face conveyor, the improvement comprising:

support arms disposed on the face side of the said shearer drum, high pressure liquid jets for cutting the seam area to accommodate said support arm;

wherein the end of said support arm adjacent to the said shearer drum is equipped with oscillating nozzles for directing the said high pressure liquid jets substantially in the direction of travel of the said apparatus, and the said support arm is positioned forwardly of the diameter of the said shearer drum; an inclined surface extending over the entire height of said support arm forwardly of said shearer drum and functioning as a cutting edge.

4,445,725

VEHICLE HYDRAULIC BRAKE SYSTEM AND APPARATUS

Gerald M. Sivulka, Ann Arbor, Mich., assignor to Kelsey Hayes Company, Romulus, Mich.

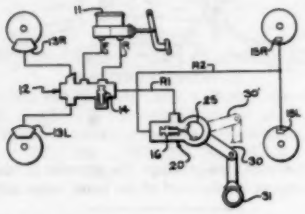
Continuation of Ser. No. 134,801, Apr. 11, 1980, abandoned. This application Jun. 4, 1981, Ser. No. 270,437

Int. Cl.³ B60T *8/22*

U.S. Cl. 303—6 C **6 Claims**

1. In a pressure regulating valve for a vehicle fluidic brake

system wherein said valve includes operable valve means for regulating the input to output pressure relationship and positionable cam means communicating with said operable valve means whereby the position of said cam means in relation to said operable valve means acts to selectively restrict the function of said operable valve means thereby modifying the input to output pressure relationship, the improvement wherein said



positionable cam means includes rotatable shaft means, coupling means between said cam means and said rotatable shaft means for driving said cam means in response to said rotatable shaft means, said coupling means including lost motion means whereby said rotatable shaft means functions independent of said cam means whenever said cam means exhibits a predetermined resistive force.

4,445,726

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

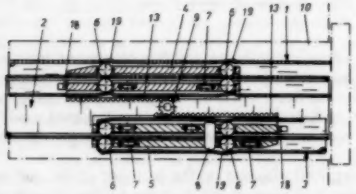
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Division of Ser. No. 169,195, Jul. 15, 1980, Pat. No. 4,351,575. This application Jul. 19, 1982, Ser. No. 399,231

Claims priority, application Austria, Jul. 19, 1979, 4980/79; May 6, 1980, 2416/80

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—3.8 **5 Claims**



1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein the drawer is slidably insertable into and removable from a furniture body, said assembly comprising:

a supporting rail adapted to be connected to a side wall of a furniture body;

a first carriage mounted to run along said supporting rail, said first carriage having bearing supports;

a pull-out rail adapted to be connected to a side of a drawer;

a second carriage mounted to run along said pull-out rail, said second carriage having bearing supports;

a center rail having vertically spaced horizontal flanges extending between and supported by said bearing supports of said first and second carriages, such that said carriages are movable along said center rail and said center rail is movable with respect to said pull-out and supporting rails; and

means for controlling relative movement of said center rail with respect to said first and second carriages, said controlling means comprising first and second racks on said first and second carriages, respectively, and a pinion mounted on said center rail and engaging said first and second racks.

4,445,727

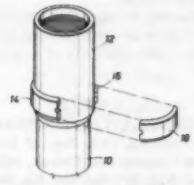
METHOD OF ATTACHING A WEAR STRIP TO DOWNHOLE MEMBERS

Charles F. Funk, Gulfport, Miss., assignor to Metal Parts, Inc., Gulfport, Miss.

Filed Dec. 18, 1981, Ser. No. 332,105

Int. Cl.³ E21B *17/10*; F10C *43/02*

U.S. Cl. 308—4 A **1 Claim**



1. A method of encircling the outside surface of a tool joint with a band of wear resistant material comprising the steps of positioning end-to-end around the outside surface of a tool joint a plurality of strips of cast, relatively brittle, drillable material curved along their longitudinal axis with a radius of curvature approximately equal to the radius of curvature of the outside surface, clamping the strips in position on the tool joint, and puddling weld metal in first one opening and then another formed between the abutting ends of strips by notches in the ends of the strips that expose the surface of the tool joint for fusion with the weld metal and that have an increasing cross-sectional area away from the tool joint, puddling additional weld metal in said openings at brief intervals until a plug of weld metal has been formed that is fused to the surface to be protected but not to the strips to lock the strips on the tool joint while maintaining the temperature of the strips below that at which they will crack due to thrermal stress.

4,445,728

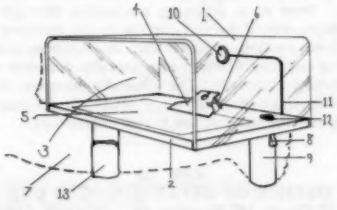
ALL WEATHER CLIPBOARD

Daniel W. Bratton, 3633 - 33rd Ave. South, Minneapolis, Minn. 55406

Filed Jun. 18, 1979, Ser. No. 49,575

Int. Cl.³ A61G *11/00*

U.S. Cl. 312—1 **5 Claims**



1. An all weater clipboard for out-of-door use comprising, in combination:

(a) a planar base member for providing a writing surface;

(b) a spring biased clip member mounted upon said base member and cooperating with said writing surface for holding a sheet to be written upon in place on said base member;

(c) a clear plastic shroud member having a top wall and at least three side walls depending generally at right angles to said top wall, said side walls being attached to the

perimeter of said base member to space said top wall a predetermined distance above said planar base member;

(d) actuator means extending outside of said shroud for actuating said spring biased clip member;

(e) a tubular hand grip member extending generally normal from the underside of said planar base member; and

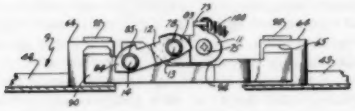
(f) a battery powered lamp contained within said shroud for illuminating said sheet to be written upon, the battery for said battery powered lamp being contained in said tubular hand grip member.

4,445,729

OVER-CENTERED LOCK ARRANGEMENT FOR OFFICE FURNITURE UNITS

Douglas Scheerhorn, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 26, 1982, Ser. No. 362,452
Int. Cl.³ F05B *65/46*
U.S. Cl. 312—219 **21 Claims**



1. A lock arrangement for office furniture units such as desks, credenzas, and the like, that include one or more pedestals having at least one closable compartment therein, such as a drawer, a cabinet or the like, with means for locking said compartment closed, said lock arrangement comprising:

a primary lock mounted in said unit, and having lock tumblers mounted in a cylinder rotatable between locked and unlocked positions;

at least one lock slide slidably supported in said unit, and connected with said compartment locking means, whereby reciprocation of said slide lock between locked and unlocked positions locks and unlocks said compartment;

a cam lock assembly comprising a crank arm extending radially of the axis of rotation of said tumbler cylinder, and rotating therewith; an actuator arm having a first end pivotally connected with said crank arm at a first pivot point, and a second end pivotally connected with said lock slide at a second pivot point, whereby rotation of said tumbler cylinder reciprocates said lock slide; said first and second pivot points being positioned to assume an over-centered relationship with respect to the axis of rotation of said tumbler cylinder in the locked position, whereby external forces applied to said lock slide in a direction to force said lock arrangement unlocked, rotatably urge said tumbler cylinder further into the locked position for improved security, and to prevent damage to said lock tumblers.

4,445,730

SPEAKER CABINET

Jimmie R. Cross, R.R. #1, Box 646, Shirley, Ind. 47384

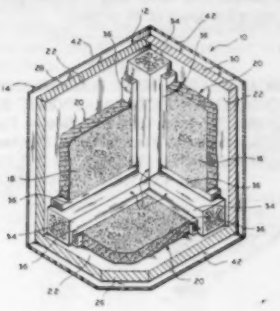
Filed Jul. 30, 1981, Ser. No. 288,306
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—214 **10 Claims**

1. A speaker cabinet, comprising:

a cabinet having a substantially continuous outer surface defining the shape thereof, said cabinet having an opening therein in direct communication with a sound chamber defined by an inner surface of said cabinet, said sound chamber being designed to emit sound wave energy through said opening; and

means associated with said inner surface of said cabinet to substantially preclude resonance of said cabinet, said cabinet having a first resonance frequency and said resonance precluding means including a rigid reinforcing liner having a second, higher resonance frequency, said reinforcing liner being substantially coextensive with said inner surface of said cabinet;

said cabinet including at least one wall defining an enclosure, said reinforcing liner comprising a layer of resonance



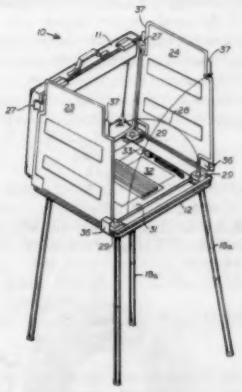
resistant material laminated to said wall, said resonance resistant material being a cement-like mixture that expands as it sets, said cabinet also including a plurality of braces defining a frame to support said wall, said braces being formed of a substantially incompressible material, said resonance resistant material being disposed on said wall between said braces.

4,445,731

PORTABLE VOTING BOOTH

John E. Ahmann, 1400 Duhig Rd., Napa, Calif. 94558

Filed Jan. 8, 1982, Ser. No. 337,967
Int. Cl.³ A47B *43/00*; G07C *13/00*; A47B *3/06*
U.S. Cl. 312—223 **10 Claims**



1. In a portable, self-contained voting booth apparatus having a foldable carrying case having an upper section hinged to a lower section, four multiple-section take-apart legs, a pair of side shields and a vote recorder to which may be secured a punch card type vote registering device, the improvement comprising:

four corner members mounted at the front and rear interior corners of the lower section of the carrying case, each having a leg socket oriented downwardly to receive and grip a leg inserted into the socket from below, through the bottom of the lower section, each corner member also

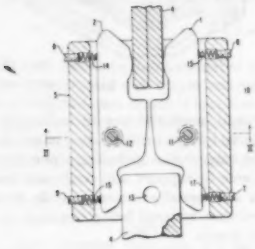
including a horizontal flange positioned to receive an edge of the vote recorder thereunder to lock the vote recorder in place, the corner members and flanges being spaced so that the vote recorder can be inserted obliquely under one pair of flanges, then swung down into position adjacent to and below the opposite pair of flanges and moved slidingly toward and under said opposite pair to retain the vote recorder down at all corners.

4,445,732

ELECTRICAL STAB CONNECTING MEANS UTILIZING EDDY CURRENT ELECTROMAGNETIC REPULSION

John A. Wafer, Brighton Township, Beaver County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,824
Int. Cl.³ H01R *11/30*
U.S. Cl. 339—12 R **4 Claims**



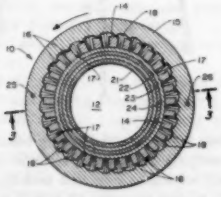
1. An electrical stab connector, comprising:
(a) a plurality of electrical contact fingers disposed to make contact with an electrical bus means for supplying electrical power thereto;
(b) an eddy-current bus means for carrying eddy-currents disposed in a position generally parallel with said plurality of electrical contact fingers;
(c) an air gap isolating said eddy-current bus means from said plurality of electrical contact fingers; and
(d) said eddy-current bus means is comprised of an electrical conducting material whereby eddy-currents are induced into said eddy-current bus means to create electromagnet forces that repel said plurality of electrical contact fingers into engagement with said electrical bus means.

4,445,733

GROUNDING RING FOR SHIELDED CABLE

Gary G. Deel, 1289 4th St., #B, Los Osos, Calif. 93402

Filed Jun. 17, 1982, Ser. No. 389,191
Int. Cl.³ H01R *4/24, 4/66*
U.S. Cl. 339—14 R **5 Claims**



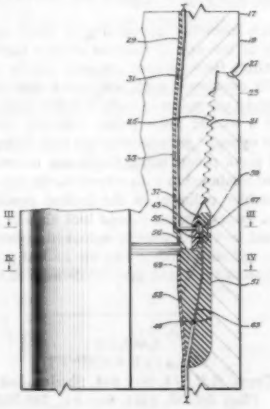
1. A grounding ring device for making 360° peripheral electrical continuity connection to the shielding of shielded electrical cable assemblies having one or more insulating layers and one or more shielding layers about the electrical cable, comprising:
a. an electrically conductive inner ring operable to fit contiguously about the outer surface of and electrically shielded cable assembly;
b. an electrically conductive outer ring in close electrical contact and concentric with said inner ring;
c. said inner ring provided with a multitude of radially aligned passageways closely spaced circumferentially there about and extending therethrough;
d. said outer ring provided with critically aligned cam grooves closely spaced circumferentially about the inner surface thereof, respective to and equal in number to the multitude of radial passageways in said inner ring;
e. separate individual electrically conductive needlelike grounding spike slideably positioned in each of the closely spaced radial passageways of said inner ring and having a drive end thereof extending into a respective one of said cam grooves;
f. each of said cam grooves providing a camming surface operable to bear against the drive end of a respective one of said needlelike grounding spikes; rotation of said outer ring concentrically about said inner ring for a distance approximately equal to the width of one of said cam grooves being operable to move the cam surface of each said cam groove against the drive end of each respective grounding spike and thereby move all said grounding spikes radially inward in their respective radial passageways forcing said grounding spikes to pierce the outer surface of said electrical cable assembly and provide peripheral electrical continuity connection with the electrical cable shielding for efficient grounding thereof.

4,445,734

TELEMETRY DRILL PIPE WITH PRESSURE SENSITIVE CONTACTS

Robert A. Cunningham, Bellaire, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 4, 1981, Ser. No. 327,524
Int. Cl.³ H01R *4/64*
U.S. Cl. 339—16 C **8 Claims**



1. In a string of drill pipe having a plurality of sections adapted to be screwed together, and a conductor segment extending through each section, an improved means for electrically coupling each segment together when the string is made up, comprising:
a pair of electrical contacts, each connected to opposite ends of the conductor segment; and
mounting means for mounting the contacts to each of the sections of pipe so that when made up to other sections, one contact fits within the other in electrical engagement and insulated from the sections, and for positioning the

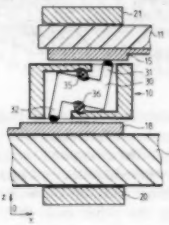
contacts so that one is urged laterally toward the other in response to internal pressure in the drill string.

4,445,735

ELECTRICAL CONNECTION DEVICE FOR HIGH DENSITY CONTACTS

Jean Bonnefoy, Crespieres, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 2, 1981, Ser. No. 326,530
Claims priority, application France, Dec. 5, 1980, 80 25861
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 M **21 Claims**



1. An electrical connection device for connecting a first plurality of electrical terminals to corresponding second electrical terminals, the device comprising a housing extending in a predetermined direction, and a plurality of rigid conductor elements having first and second contact surfaces, the conductor elements being supported within the housing by elastically deformable means so as to enable the conductor elements to pivot independently, one from the other, in a plane substantially normal to said predetermined direction, the elastically deformable means biasing the conductor elements to a terminal-contacting position at which the first and second contact surfaces respectively contact corresponding first and second terminals.

4,445,736

METHOD AND APPARATUS FOR PRODUCING A PREMOLDED PACKAGING

John R. Hopkins, Cambridge, Md., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1982, Ser. No. 364,165
Int. Cl.³ H05K *1/00*; H01R *43/00*
U.S. Cl. 339—17 CF **4 Claims**

1. A package for supporting and interconnecting integrated circuit chips of the leadless type, said package being formed by the steps of:

forming first and second webs of conductive material;

stamping said webs to form ladders of terminals in a high density array of parallel spaced apart terminals;

molding first package portions on opposite ends of said terminals of said first web;

cutting said terminals substantially centrally of the ends and forming them with respect to said first package portions;

overlying said second web of terminals transversely to said first web and between said first package portions;

molding second package portions on opposite ends of said terminals of said second web with said second package portions integrally joining said first portions;

cutting said second terminals substantially centrally of their ends and forming them with respect to said second package portions; and

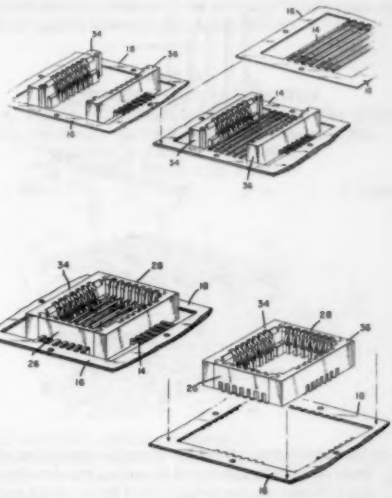
separating said package from said webs.

3. A method for forming a package for leadless integrated circuit chips comprising the steps of:

forming first and second webs of terminals from conductive materials with the terminals being in the form of a plurality of parallel spaced terminals extending transversely across the web in a ladder like configuration joined at their ends by carrier strips;

forming a partial package in a first molding operation by molding first housing members at opposite ends of the terminals of said first web;

cutting the terminals of the first web substantially centrally of their ends and forming them with respect to said first housing members;



overlying said second web of terminals transversely with respect to said first web and between said first housing members;

molding second housing members on opposite ends of said second terminals and integrally joining said first housing portions;

cutting said terminals of said second web substantially centrally of their ends and forming them with respect to said second housing members; and

cutting said formed package from said carrier strips.

4,445,737

ELECTRICAL DISTRIBUTION SYSTEM FOR LIGHTS AND CONNECTORS THEREFOR

William B. Long, Camp Hill; Donald L. Metzger, Harrisburg, and John R. Shuey, Carlisle, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 19, 1981, Ser. No. 322,809
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—18 C **9 Claims**

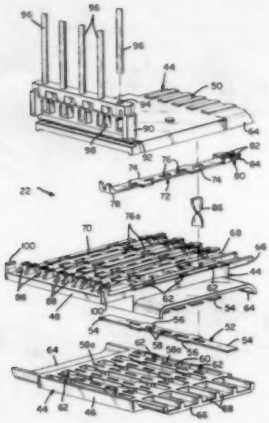
1. An electrical distribution system for an electric lighting system comprising a plurality of electric lights, an electric power box for supplying electrical power to the electric lights, an electric switch for switching the electric lights on or off, and electric connectors for electrically interconnecting the electric lights, power box and switch characterized in that:

an electric light connector mountable on each of the electric lights and comprising an insulating housing having contact members therein for electrical connection with the electric leads of each of the electric lights;

a control connector electrically connectable with one of said electric light connectors and comprising an insulating housing having a first level of contact members and a second level of contact members insulated from each other, connection members extending between said first

and second levels of contact members and interconnecting them in a preselected manner, one of said first and second levels of contact members being electrically connectable with said contact members of said light connector and with electric leads connected to said electric switch;

a power-in connector including an insulating housing having contact members electrically connectable with electric power leads from said power box and electrically connectable with the other of said first and second levels of contact members;



an interconnection connector assembly comprising electric leads electrically connected to contact members in insulating housings, the contact members in one of the insulating housings being electrically connectable with the contact members in said light connector having said control connector connected therewith and the contact members of the other of the insulating housings being electrically connectable with the contact members of another of said electric light connectors.

4,445,738

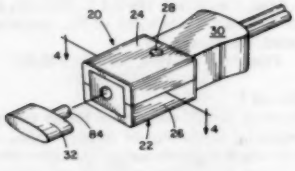
LOCKING DEVICE FOR ELECTRICAL PLUGS

Erich K. Wiencke, 458 Kent Rd., Riverside, Ill. 60546

Continuation-in-part of Ser. No. 283,949, Jul. 16, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,670

Int. Cl.³ H01R *13/44*

U.S. Cl. 339—37 **26 Claims**



1. A locking device for use with an electrical plug having two or more prongs, comprising a housing, a lock mechanism disposed within said housing, means for securing said lock mechanism in said housing, locking members movable translationally from an unlocking position to a locking position to lockingly engage at least two of said prongs when said plug is inserted into the housing camming means translationally coupling said locking members together, spring means for normally biasing said locking members into said locking position, manually operable means engageable with said camming means for moving said locking members to said unlocking position to obtain the release of said inserted plug.

4,445,739

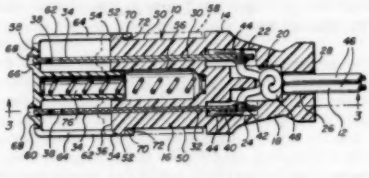
MALE PLUG WITH AUTOMATIC PRONG COVER

Norman W. Wooten, 5751 55th Ter. North, St. Petersburg, Fla. 33709

Filed May 4, 1982, Ser. No. 374,786

Int. Cl.³ H01R *13/44*

U.S. Cl. 339—42 **12 Claims**



1. An elongated body constructed of dialectric material, said body including opposite end portions, one of said end portions including a pair of parallel elongated terminals constructed of conductive material embedded therein and having one pair of ends thereof projecting endwise outwardly of said one end portion of the body, the other ends of said terminals being disposed in the other end portion of said body and being adapted for electrical connection with a pair of conductors, said one end portion of said body including a longitudinal bore formed therein intermediate and paralleling said terminals and opening endwise outwardly of said one end portion, said one body end portion including remote longitudinal side surfaces, the ends of said surfaces adjacent said one end portion including laterally outwardly projecting abutments, and a protective sleeve snugly slidably disposed over and shiftable longitudinally of said one end portion of said body and including remote longitudinal walls having slots formed therein in which said abutments are slidably received, the end of said sleeve corresponding to said one end portion of said body being closed by an end wall extending thereacross, said end wall having a pair of openings formed therethrough in which said terminals are slidably received, the ends of said slots remote from said end wall being closed and abuttingly engageable with said abutments to limit sliding movement of said sleeve away from said other end portion of said body to a position with the free ends of said terminals disposed in and spaced inwardly of the opposite ends of said openings, said end wall being abuttingly engageable with said one end portion of said body to limit sliding movement of said sleeve toward said other end portion of said body, and a coiled compression spring having one end seated in said bore and the other end abutted against said end wall.

4,445,740

CIRCUIT BOARD ASSEMBLY

Keith L. Wallace, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 26, 1982, Ser. No. 371,850

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **7 Claims**

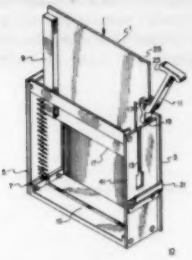
1. A circuit board coupling assembly comprising:

a circuit board receiving assembly having first and second planar sides in opposed spaced relation generally parallel to one another and coupled by a third planar side extending between said first and second side to form a generally U-shaped channel;

a plurality of first electrical terminals positioned along said first side within said channel;

a planar circuit board having first, second and third edges, said first and second edges being generally parallel to one another and said third edge extending generally perpendicular to said first and second edges, said first edge hav-

ing a plurality of second electrical terminals extending therealong in a configuration matching that of said first electrical terminals along said first side, said circuit board being slidably received between said first and second sides such that said first and second edges slide parallel to and adjacent said first and second sides, respectively, and said



third edge slides into adjacent parallel abutting relationship with said third side; and

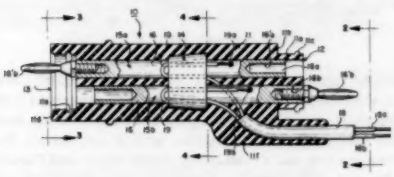
means for moving said circuit board in a direction perpendicular to the plane of said first and second sides to cause engagement and disengagement of said first and second electrical terminals.

4,445,741

DOUBLE-PLUG SEISMIC CONNECTOR

Ira R. Annoot, Pasadena, Tex., assignor to Houston Geophysical Products, Inc., Houston, Tex.

Filed Oct. 13, 1981, Ser. No. 310,387
Int. Cl.³ H01R *19/56*
U.S. Cl. 339—49 R **5 Claims**



4. A double-ended, seismic takeout clip comprising:

an elongated unitary body made of an elastic insulating material;

a solid cylindrical male connector plug, having a pair of electric contacts, projecting outwardly from one end of said body, and an O-ring around the cylindrical body portion of said male plug;

a tubular female connector plug, having a pair of electric contacts, projecting outwardly from the opposite end of said body, and the tubular body portion of the female plug having an inner cylindrical wall defining an annular groove;

said body portions of said male and female plugs being dimensioned to allow, in use, said tubular female plug to snugly accept a male plug of a second like takeout clip, whereby said groove frictionally receives the male plug's O-ring for protecting against moisture penetration into the plugs and disconnection of the plugs;

an anchor embedded inside said body, said anchor having a pair of main longitudinal bores and two pairs of auxiliary longitudinal bores;

a pair of laterally-spaced apart longitudinal electric conductors embedded within said body, each conductor extending through one of said main bores and being connected to, for providing a conductive path between, an electric contact in the male plug and an electric contact in the female plug; and

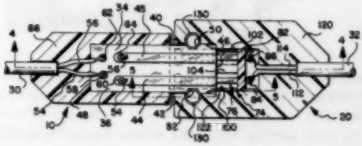
a pair of insulated wires, each wire having an inner end which loops around one pair of said auxiliary bores and the bare metallic end portion of the wire making an electric connection with one of said conductors, and each wire having an outer end which projects outwardly of said body in a waterproof manner, whereby the pair of wires which project outwardly of said body are electrically connected across said pair of conductors and thus across the pair of contacts in each plug, and the interconnected electric contacts of the male and female plugs are sealed against moisture penetration therein.

4,445,742

ELECTRICAL CABLE CONNECTOR

Philip S. Fullam, Springfield, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Filed Feb. 8, 1982, Ser. No. 346,447
Int. Cl.³ H01R *4/00, 11/00*
U.S. Cl. 339—61 M **5 Claims**



1. An electrical connector comprising:

a first connector member including a plate-like body of electrically non-conductive material having opposed relatively wide faces, relatively narrow edges, a connector end, and an attachment end,

at least one strip of electrically conductive material on at least one of said faces extending from said connector end toward said attachment end, and

a first lead wire anchored to said attachment end and attached to said strip,

said edges having retaining notches therein adjacent said connector end,

a second connector member including a housing of resilient electrically insulating material forming a socket with an open end dimensioned to receive said body of said first connector member,

a contact member located in said socket in position to contact said strip and having a portion adapted for attachment to a second lead wire,

rigid retainer pins incorporated in said housing extending across said socket and spaced apart to interfit with said notches,

said housing being deformable so as to permit displacement of said pins therein in response to insertion or withdrawal of said first connector member with respect to said second connector member.

4,445,743

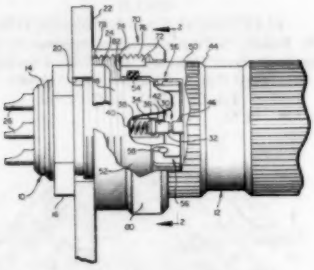
QUICK DISCONNECT CONNECTOR WITH POSITIVE LOCKING DEVICE

Willem F. Bakker, Wyoming, Ill., assignor to Breeze Illinois, Incorporated, Wyoming, Ill.

Filed Aug. 8, 1979, Ser. No. 64,780
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—90 R **4 Claims**

1. For use with a quick-disconnect connector having plug and receptacle members which when locked together in mating relation establish electrical continuity through the connector, cooperating bayonet lock means including at least one

J-shaped groove formed in one of the plug and receptacle members, and at least one cooperating pin formed on the other of the plug and receptacle members and adapted to fit into said J-shaped groove, each said J-shaped groove having an axial recess portion and also a transverse recess portion having a seating area separated from the axial recess portion across detent hump means, said pin being adapted to seat against said seating area in the mated condition of the plug and receptacle members, movable spring-loaded contacts on one of said plug and receptacle members engaged and deflected by contacts on the other of said plug and receptacle members when said plug and receptacle members are in mated condition with said spring-loaded contacts serving to bias said pin in seated position in said seating area, the improvement comprising, an annular sleeve element having internal thread means, one of the plug and receptacle members having external thread means for cooperation with the internal thread means of said sleeve element, and the sleeve element being rotatable on one of the plug and receptacle members to move the sleeve axially toward the other of the plug and receptacle members, said sleeve element when bottomed relative to the opposite one of the plug and receptacle members being effective to maintain said pin positively seated in said seating area thereby preventing axial movement of the plug and receptacle members toward one another to provide a releasable positive lock against disengagement of said bayonet lock means.

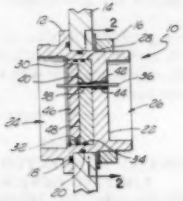


4,445,744

HIGH PRESSURE ELECTRICAL CONNECTOR

Albert R. Sedig, Buckeye, and Francis H. Ingham, Scottsdale, both of Ariz., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,707
Int. Cl.³ H01R *4/70*
U.S. Cl. 339—94 M **8 Claims**



1. A high pressure withstanding electrical connector or penetrator comprising:

a shell adapted to be mounted in a bulkhead or the like;

said shell having an integral support web extending transversely across its interior dividing said shell into a high pressure side and a low pressure side;

a header mounted in said shell on said high pressure side, said header having an outer face and an inner face adjacent to said web;

said web providing support for said header across substantially its entire inner face;

aligned passages extending through said header and said web;

a conductor passing through said passages with one end extending into said high pressure side of said shell and the other end extending into said low pressure side; and

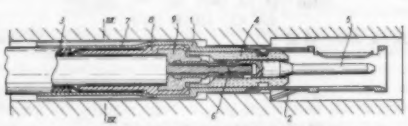
a glass ring in said header passage providing a glass-to-metal seal between said conductor and said header, said glass ring extending substantially the complete length of said header passage.

4,445,745

ELECTRICAL CONNECTORS FOR COAXIAL AND TWO-WIRE CABLES

Georges Cartesse, Le Blanc Mesnil, France, assignor to Societe Generale pour l'Industrie Electronique (S.O.G.I.E.), Rosny-sous-Bois, France

Filed Dec. 21, 1981, Ser. No. 332,712
Claims priority, application France, Dec. 24, 1980, 80 27447
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. An electrical connector contact for coaxial cables or two-wire cables comprising, an outer pre-assembled assembly comprising a tubular electrically conductive body having a front electrical contact portion with a rearwardly opening sleeve portion, and an insulating sleeve within and fixed to said body, said sleeve portion having an open rearward end and said insulating sleeve being spaced axially from said rearward end, an inner pre-assembled assembly comprising, a contact body having a contact and a socket with an opening facing away from the contact for rearwardly receiving a conductive end of a first wire of a cable, an insulating bushing fixed to said contact body, and an electrically conductive barrel fixed to said insulating bushing in insulated relation to said contact body, said barrel having an open rearward end for receiving therein an insulated portion of the first wire whose conductive end is inserted in the socket of the contact, said barrel including a conductive surface for electrical connection of a second conductor of the cable, said socket of said contact body including means for electrically connecting the conductive end of the first wire inserted therein to the contact, said contact of said inner assembly being a close slidable fit in said outer assembly, and said barrel being receivable in said rearwardly opening sleeve portion of the outer assembly so that said inner assembly can be inserted forwardly into said outer assembly after connecting the cable to the inner assembly, said rearwardly opening sleeve comprising, means for electrically connecting said front electrical contact portion of the outer assembly to the second wire of the cable, and means for mechanically securing the inner assembly against axial separation from the outer assembly.

4,445,746
RESILIENT METAL CONTACT BRUSH

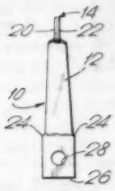
Chris Cosby, Leighton Buzzara, and Martin Heath, Dunstable, both of England, assignors to Delco Products Overseas Corporation, Detroit, Mich.

Filed Oct. 21, 1982, Ser. No. 435,637

Claims priority, application United Kingdom, Oct. 27, 1981, 8132396

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—252 R **2 Claims**



1. A resilient metal contact brush for use in an electric motor, which contact brush comprises a strip-like metal member having at one end thereof a fixing aperture and at the other end thereof a contact head protruding substantially normally to the plane of the strip-like member, said contact head comprising two flat ear-like protrusions integral with the strip-like member adjacent said other end thereof, said ear-like protrusions further projecting at right angles to the plane of the strip-like member and being in planar contact with one another of substantially the whole of their planar area.

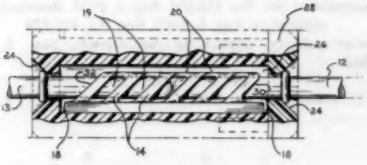
4,445,747
RIB CAGE TERMINAL

Douglas A. Neidich, Harrisburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1982, Ser. No. 400,242

Int. Cl.³ H01R *13/12*

U.S. Cl. 339—256 R **7 Claims**



1. A female electrical terminal comprising an electrically conducting rib cage mounted on a spine the rib cage having at least four pair of ribs in the form of curved cantilvered beams attached at one end to the spine and spaced apart at its other end from a corresponding beam, each beam being at an acute angle with respect to the spine, the rib cage having a diameter sufficient to accept a round or square pin for electrical termination.

4,445,748
MASS TERMINATION OF DENSELY GROUPED CONDUCTORS

William R. Evans, Clemons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1980, Ser. No. 136,852

Int. Cl.³ H01R *4/24*

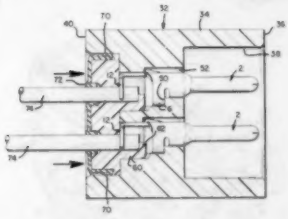
U.S. Cl. 339—94 M **7 Claims**

1. An electrical connector, comprising:

a housing having a first end and a wire receiving second end, one or more cavities extending through said housing from said first end to said second end,

an electrical terminal in each said cavity having an electrical contact portion projecting toward said housing first end, and a conductor connecting portion projecting toward said housing second end,

each said connecting portion being pivotally joined to the remainder of a respective said terminal and being provided with a slot, the opposite sides of which define conductor gripping jaws constructed for straddling a conductor which extends both into said housing second end and along a respective said cavity,



each said connecting portion being pivotable to a position transversely of the remainder of a respective said terminal to wedge forcefully said jaws into straddled gripped connection with a respective said conductor,

conductor support means mounted to said housing for supporting said conductors laterally of their lengths as said conductors are straddled by said jaws and as said connecting portions are pivoted to forcefully wedge said jaws into straddled gripped connection with said conductors, and

a web of resilient material radially compressibly encircling said conductors and compressibly sealing the interface of said housing and said conductor support means.

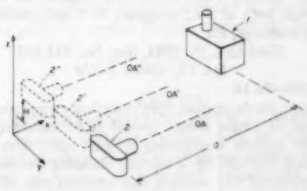
4,445,749
HOLOGRAPHIC PRODUCTS AND PROCESSES

Stephen A. Benton, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 6, 1980, Ser. No. 157,187

Int. Cl.³ G03H *1/26*

U.S. Cl. 350—376 **8 Claims**



1. A process for making an achromatic holographic stereogram, comprising the steps of: projecting a sequence of transparencies onto a predetermined projection plane; sequentially holographically recording each of the sequence of projected images on contiguous narrow elongated strips of a first photographic plate, said sequential holographic recording being made with a collimated reference beam, said photographic plate being inclined to a normal to said projection plane at an angle α of from 35° to 41°; illuminating the resulting hologram with a beam conjugate to said reference beam; and holographically recording the image produced by said illuminating beam onto a second photographic plate, said second photographic plate being in a position corresponding to the location of said projected images relative to said hologram, said second holographic recording being effected by using a second collimated

reference beam to illuminate said second photographic plate at an angle of incidence ϕ related to the angle α at which said first recited plate is inclined to said normal by $\phi = \sin^{-1} \tan \alpha$.

4,445,750

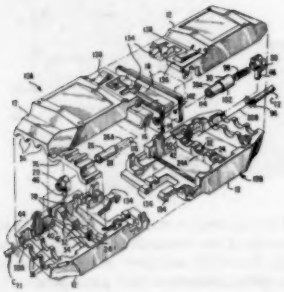
ARTICULATING FIBER OPTIC CONNECTORS WITH RESILIENT MOUNTING BLOCK

Igor Grois, Lincolnwood; Mark Margolin, Chicago, and Alan Berg, Wood Dale, all of Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Filed Jun. 22, 1981, Ser. No. 275,844

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **17 Claims**



1. An optical fiber connector including a housing having a mating end, a mounting block in said housing movable relative to said housing toward and away from said mating end, at least one fiber clamp mounted on said block for gripping an optical fiber, and resilient means engaging said block and said housing for urging said block and fiber clamp toward said mating end and accomodating movement of said block and said fiber clamp away from said mating end against the force of said resilient means in response to an overriding opposing force.

4,445,751

METAL COATED, TAPERED, OPTICAL FIBER COUPLED TO SUBSTRATE AND METHOD OF FABRICATION

William C. Divens, Penn Hills, and Eugene G. Vaerewyck, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1981, Ser. No. 312,555

Int. Cl.³ G02B 5/174

U.S. Cl. 350—96.14 **6 Claims**

1. A single mode optical fiber coupling comprising:

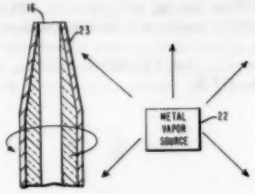
a section of single mode optical fiber including a cone-shaped portion comprising a fiber optic core having a polished end surface, a tapered cladding terminating near said polished end surface, the terminal end of said cladding having a diameter substantially equal to the diameter of said core, said cladding substantially uniformally tapering to a diameter substantially equal to the outer diameter of said optical fiber core, and a metal layer affixed to the outer surface of said cone-shaped portion of said single mode optical fiber.

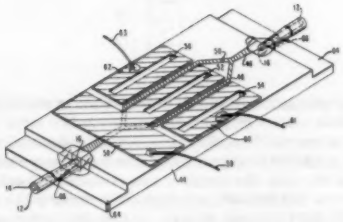
2. An optical device comprising:

(a) a substrate of electro-optically sensitive material;

(b) an optical waveguide formed in and extending to the surface of said substrate and terminating at first and second edges of said substrate and including two spaced apart central portions having their ends joined to surround a first portion of said substrate surface, said substrate including a first groove in said first portion of said substrate surface, and second and third grooves in the surface alongside said spaced apart central portions of said optical waveguide and exterior to said first portion of said substrate surface;

(c) a first electrode affixed to a first portion of the surface of said substrate between said central portions; and





(d) second and third electrodes affixed to second and third portions of the surface of said substrate, alongside said central portions of said optical waveguide and exterior to said first portion of said substrate surface.

4,445,752

OPTICAL FIBER SWITCH WITH ROTARY GEAR MOVEMENT

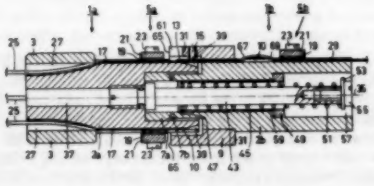
Johannes W. Faber, Eindhoven, Netherlands, and Günter Weick, Eckental, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 183,601, Sep. 2, 1980, abandoned. This application Aug. 6, 1982, Ser. No. 405,828

Claims priority, application Netherlands, Sep. 3, 1979, 7906580

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 **3 Claims**



1. A switch for optically coupling a first optical fiber to two or more other optical fibers, the first optical fiber being connected to one other optical fiber at a time, said switch comprising:

a first holder having a longitudinal axis and having an exterior surface, said holder having two or more V-shaped grooves on the exterior surface equidistant from and extending parallel to the longitudinal axis, said V-shaped grooves being situated around the longitudinal axis at either equal angular separations or angular separations which are a multiple of a given pitch angle, said V-shaped

grooves in operation accommodating optical fibers, said holder having a first side at which the V-shaped grooves each transform into a funnel-shaped inlet opening, the first side of the holder having an end face on which is provided a first gear ring which is transverse to and concentric with the longitudinal axis;

a second holder having an exterior surface with at least one V-shaped groove on the exterior surface extending parallel to the longitudinal axis, said V-shaped groove in operation accommodating an optical fiber, said second holder having an end face on which is provided a second gear ring which is transverse to and concentric with the longitudinal axis; and

means for resiliently connecting the holders by engaging the first and second gear rings to each other, said means permitting displacement of the holders along the longitudinal axis against a spring force to disengage the gear rings, and said means permitting relative rotation of the holders around the longitudinal axis when the gear rings are disengaged, the magnitude of the relative rotation after the gear rings are reengaged being equal to the pitch angle or a multiple thereof.

4,445,753

END FITTING FOR OPTICAL FIBRE CONNECTOR AND CONNECTOR EQUIPPED WITH SUCH AN END FITTING

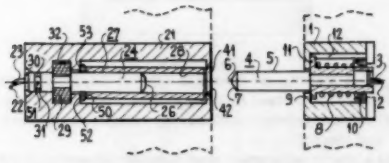
Roger Collignon, Suresnes, France, assignor to Socapex, Suresnes, France

Filed Oct. 26, 1981, Ser. No. 315,268

Claims priority, application France, Oct. 31, 1980, 80 23391

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **15 Claims**



7. An optical fibre connector comprising two end fittings which, when joined, ensure the connection of at least one optical channel, at least one of the end fittings comprising at least one substantially cylindrical locating sleeve in which is fixed an optical fibre, said locating sleeve having at its front end a contact face at which the fibre issues and in the vicinity of its back end means for positioning the locating sleeve in the end fitting, as well as means for orienting said locating sleeve, wherein the means for orienting the locating sleeve includes ball joint means positioned between the positioning means of the locating sleeve and the back end of the end fitting for permitting pivotal movement of the locating sleeve within said end fitting and wherein the positioning means includes a disk having a central groove whose outer and inner base surfaces respectively cooperate with shoulders defined by the end fitting of the connector and the locating sleeve located therein, said disk defining a transverse clearance with the end fitting while being fixed to prevent translational movement thereof.

4,445,754

GLASS OPTICAL FIBRES AND GLASS COMPOSITIONS THEREFOR

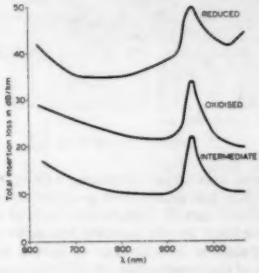
Keith J. Beales, Ipswich; Sally Partington, Colchester, and Anthony G. Dunn, Felixstowe, all of Great Britain, assignors to Post Office, London, England

Filed Apr. 1, 1980, Ser. No. 136,325

Claims priority, application United Kingdom, Apr. 4, 1979, 7911765

Int. Cl.³ C03B 5/225, 37/075; C03C 3/08, 3/30

U.S. Cl. 350—96.34 **8 Claims**



1. A high numerical aperture optical fibre core glass comprising soda, silica, germania, boric oxide, optionally barium oxide, and a redox buffering agent, and having a composition selected from the range of glasses which comprise

(i) from 15 to 25 mole percent soda,

(ii) from 25 to 65 mole percent silica and germania, taken together, the content of germania not exceeding 42 mole percent,

(iii) up to 22.5 mole percent of boric oxide and barium oxide, taken together, the content of boric oxide not exceeding 20 mole percent and the content of barium oxide not exceeding 12 mole percent, and

(iv) from 0.01 to 1 weight percent of a redox buffering agent,

said composition being selected such that the glass is not subject to devitrification or phase separation and such that the glass has a refractive index greater than 1.54, said glass being characterized by having a fictive partial oxygen pressure of 10^{-5} atmospheres produced by melting appropriate materials from which the glass is formed and controlling the partial oxygen pressure of the melt by bubbling pure dry carbon dioxide through the molten glass.

4,445,755

INFRARED TRANSMITTING OPTICAL WAVE GUIDE

Kazuya Ohsawa; Toshiaki Shibata, both of Yokohama, and Kenichi Takahashi, Tokyo, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,687

Claims priority, application Japan, Apr. 3, 1981, 56-49433

Int. Cl.³ G02B 5/172

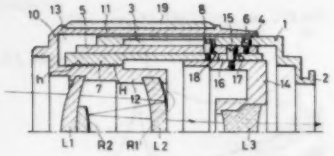
U.S. Cl. 350—96.34 **2 Claims**

1. An infrared transmitting optical wave guide formed of a core glass and a cladding glass having a smaller refractive index than said core glass, wherein both core and cladding glass comprise 52 to 69 mol% of zirconium fluoride, 10 to 24 mol% of barium fluoride, 1 to 7 mol% of lanthanum fluoride, 9 to 25 mol% of sodium fluoride and 2 to 5 mol% of aluminum fluoride; the total content of said zirconium fluoride, barium fluoride, lanthanum fluoride and sodium fluoride is chosen to be over 90 mol%; and the cladding glass contains a larger amount of sodium fluoride than the core glass.

4,445,756
REFLEX ZOOM LENS BARREL

Shinsuke Komoto, c/o Asahi Kogaku Kogyo K.K., 36-9, Maeno-cho 2-chome, Itabashi-ku, Tokyo, Japan (174)

Filed Feb. 17, 1982, Ser. No. 349,514
Claims priority, application Japan, Feb. 24, 1981, 56-25097[U]; Feb. 24, 1981, 56-25986
Int. Cl.³ G02B 15/16, 17/08, 7/10
U.S. Cl. 350—429 8 Claims

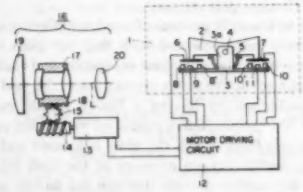


1. A reflex zoom lens barrel comprising a front frame which carries reflex optical lens means having a positive focal length, a rear frame which carries transmission optical lens means having a negative focal length, zooming means for moving the front and rear frames in directions of an optical axis, to vary the focal length of the combination of the reflex and transmission optical lens means, and focusing means for independently moving only the front frame in the optical axial directions.

4,445,757
ZOOMING DEVICE

Shigeo Enomoto; Hitoshi Hirobe, and Shinji Urata, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,443
Claims priority, application Japan, Nov. 19, 1981, 56-171400
Int. Cl.³ G02B 7/11
U.S. Cl. 350—429 4 Claims

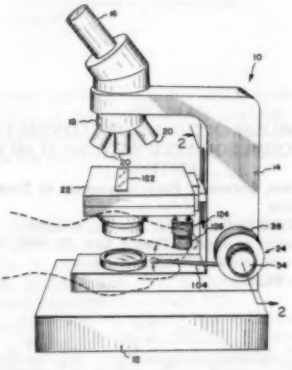


1. In combination, a zoom lens comprising a movable portion which controls the focal length of said lens, motor means for driving said movable lens portion to cause said lens to zoom, manually operable means and circuit means for controlling said motor means to cause said lens to zoom either in the focal distance shortening or the focal distance lengthening direction and to cause said zooming in each of said directions to occur at one of at least two predetermined speeds, said manually operable means comprising a rocker member, means to pivotally mount said rocker member at about its center portion for rocking motion to either side of a neutral position of said rocker member on said mounting means, spring means normally biasing said rocker member to said neutral position, said control circuit means comprising at least first and second switch means, said switch means comprising a contact member on each end of said rocker member; and said switch means, said contact member and said control circuit means being so arranged that rocking motion manually applied to said rocker member to one side of said neutral position to cause the corresponding one of said contact members to close a first one of said corresponding first and second switch means will cause said lens to zoom at a first predetermined speed in one of said directions, and continued motion of said rocker member to said one side will close the second one of said switch means to cause zooming of said lens in said one of said directions at a second predetermined speed; and motion of said rocker to the other side of said neutral position will cause similar zooming motions of said lens in the other of said directions.

4,445,758
MECHANISM FOR ACCOMPLISHING COARSE AND FINE ADJUSTMENTS IN A MICROSCOPE

Henry J. Emmel, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,424
Int. Cl.³ G02B 21/26
U.S. Cl. 350—530 8 Claims



1. In a microscope having a support frame, a monoaxial coarse-fine adjustment focusing system, comprising:

(a) a fine adjustment shaft having a pinion proximate to one end thereof;

(b) a coarse adjustment shaft coaxially mounted about said fine adjusting shaft; and supported by said microscope frame;

(c) a fine adjusting knob mounted to said fine adjustment shaft at the pinion end thereof;

(d) a coarse adjusting knob cooperatively mounted to said coarse shaft and being frictionally engaged to said microscope frame, said knob having a ring gear formed therein;

(e) a cluster gear and pinion assembly comprising a cluster gear for engaging said pinion of said fine adjusting shaft, a shaft and a cluster pinion for engaging said coarse knob ring gear;

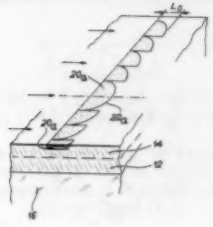
(f) means mounted to said coarse shaft for supporting said cluster gear and pinion assembly proximate to said pinion of said fine adjusting shaft and said coarse knob ring gear; and

(g) biasing means for holding said cluster gear in positive engagement with said pinion of said fine shaft, said cluster pinion in positive engagement with said coarse knob ring gear and said cluster gear shaft positively against said supporting means.

4,445,759
INTEGRATED FRESNEL LENS AND ITS PRODUCTION PROCESS

Serge Valette, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 5, 1981, Ser. No. 308,600
Claims priority, application France, Oct. 8, 1980, 80 21476
Int. Cl.[3] G02B 5/174
U.S. Cl. 350—96.12 15 Claims

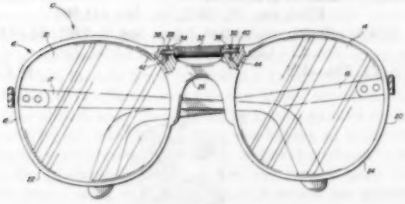


1. A Fresnel lens for integrated optics, wherein it comprises a light guide of effective index n_{eff} achieved in a substrate and incorporating a guiding layer and a number N of regions of length L(r) measured in the direction of the lens axis as a function of the distance r from the lens axis and disposed in the direction perpendicular to the lens axis, while having a refractive index such that to the right of these regions the effective index of the light guide has a value n'_{eff} which differs from n_{eff} in such a way that a light wave propagated to the right of these regions is given a phase displacement $\Delta\phi$ due to the effective index difference $n'_{eff}-n_{eff}$ and making it possible to obtain constructive light interferences at the chosen image point.

4,445,760
PAIR OF EYEGLASSES

John T. Simms, 14259 Hatteras St., Van Nuys, Calif. 91401

Filed Feb. 24, 1982, Ser. No. 351,755
Int. Cl.[3] G02C 1/08
U.S. Cl. 351—95 6 Claims



1. An improved pair of eye glasses, said eyeglasses comprising, in combination:

(a) a first eyeglass lens,

(b) a first openable holder releasably holding said first lens,

(c) a second eyeglass lens,

(d) a second openable holder releasably holding said second lens,

(e) said first and second holders comprising a first annular openable rim and a second annular openable rim, respectively gripping substantially the entire periphery of said respective first and second lens,

(f) said first rim defining a first space intersecting said first rim,

(g) said second rim defining a second space intersecting said second rim,

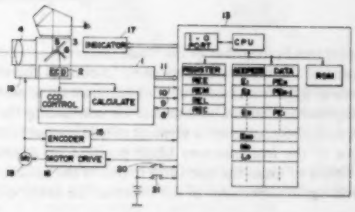
(h) a nose bridge interconnecting said first and second holders and including closure means extending horizontally between and interconnecting said holders for closing said first and second spaces to releasably lock said first lens in said first holder and said second lens in said second holder, and

(i) a pair of ear retainers secured to said holders.

4,445,761
AUTOMATIC FOCUSING DEVICE FOR USE IN A CAMERA

Norio Ishikawa, Osaka, and Takanobu Omaki, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1982, Ser. No. 431,288
Claims priority, application Japan, Oct. 2, 1981, 56-157921
Int. Cl.[3] G03B 3/10
U.S. Cl. 354—402 15 Claims



1. An automatic focusing system for use in a camera comprising:

means for successively driving an objective lens of said camera along its optical axis;

means for repeatedly detecting a focusing condition of the objective lens during the movement of the objective lens to produce a detecting signal which includes information of a defocus direction and a defocus amount of the objective lens with respect to a predetermind image plane;

means for monitoring an amount of axial movement of the objective lens between successive detections to produce a lens moving amount signal which represents the detected amount;

means for converting each detecting signal into a corresponding converted signal which would be produced from said detecting means upon the last detection in accordance with said lens moving amount signals;

means for producing a final signal in response to the converted signals in accordance with a predetermined statistic method; and

means for controlling said driving means in response to said final signal.

4,445,762
ENCODED SHUTTER BLADE APPARATUS

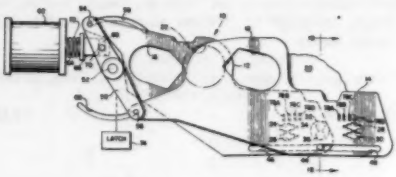
A. David Boccuti, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1982, Ser. No. 454,047
Int. Cl.[3] G03B 7/14
U.S. Cl. 354—437 10 Claims

1. In a photographic camera apparatus of the type including means for defining a film plane; means for transmitting light from a scene along an optical path to expose photosensitive film located in the film plane; and an exposure control system for allowing the passage of scene light along the optical path to the film plane for a period of time to define an exposure interval, wherein the exposure control system comprises at least two overlapping blade elements disposed for displacement in generally opposing directions with respect to each other, the improvement comprising:

means for sensing the position of the blade elements responsive to the displacement of the blade elements and for

providing an output representative of the instantaneous position of the blade elements, said position sensing means comprising a source of illumination on one side of the blade elements, a photoresponsive element on the other side of the blade elements opposite said source of illumination, a plurality of equally spaced apart like apertures in each of the blade elements located such that said apertures in one of the blade elements sequentially overlap the



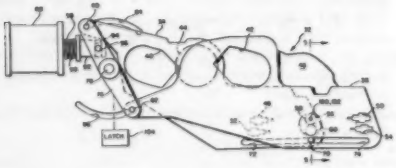
apertures in the other of the blade elements upon displacement of the blade elements so as to control the transmission of light from said source of illumination to said photoresponsive element, and means for converting the output of said photoresponsive element to said output representative of the instantaneous blade position by counting the number of times the apertures in one of the blade elements overlap the apertures in the other of the blade elements.

4,445,763

HYBRID CAMERA ARRANGEMENT

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1982, Ser. No. 454,068
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—417 **16 Claims**



1. In a hybrid photographic camera of the type wherein a source of artificial illumination is ignited at an aperture value related to a determined camera-to-subject distance in accordance with the inverse square law of light propagation and means are provided for detecting and integrating scene light to control an exposure determinating event subsequent to firing the source of artificial illumination, the improvement comprising:

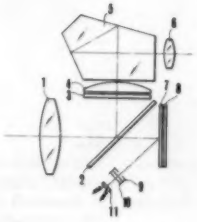
means for varying the aperture value at which the source of artificial illumination is fired such that the flash fire aperture is a predetermined number of stops larger than that aperture value which corresponds directly to the camera-to-subject distance determined in accordance with the inverse square law of light propagation and said predetermined number of stops difference progressively decreases in correspondence with increasing camera-to-subject distance.

4,445,764

LIGHT MEASURING DEVICE FOR A SINGLE LENS REFLEX CAMERA

Susumu Matsumura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,284
Claims priority, application Japan, Dec. 2, 1980, 55-170622; Dec. 2, 1980, 55-170627
Int. Cl.³ G03B *7/00*
U.S. Cl. 354—480 **4 Claims**



1. A light measuring device for a single lens reflex camera comprising:

a photographic lens;

a photosensitive means and a shutter plane on the image forming plane of the photographing lens;

light sensing means for sensing the light from at least one of the photosensitive means and the shutter plane;

a multi-focal lens between the photosensitive means and the light sensing means;

said multi-focal lens having a plurality of area zones and having a different focal length for each area zone, and

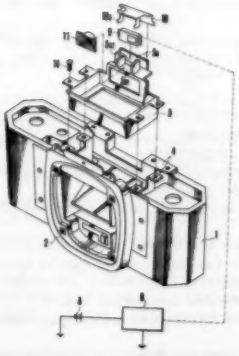
selection means for directing the light from each area zone of the multi-focal lens selectively to the light sensing means.

4,445,765

CAMERA INCORPORATING PHOTO-ELECTRO TRANSDUCER

Hiroshi Yamamoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,909
Claims priority, application Japan, Sep. 4, 1981, 56-131542
Int. Cl.³ G03B *7/00, 13/02, 17/00, 19/12*
U.S. Cl. 354—478 **10 Claims**



1. A camera incorporating a photo-electro transducer therein, comprising:

photo-electric converting means for measuring the bright-

ness of an object to be photographed, said means including at least said photo-electro transducer;

a camera body containing said photo-electric converting means therein, said camera body including at least a part which is formed with an insulating synthetic resin material and is disposed in the vicinity of the photo-electric converting means; and

a shield member formed with an electrically conductive synthetic resin material, said shield member being arranged to house and/or carry said photo-electric converting means.

4,445,766

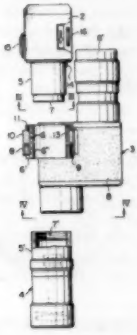
BINOCULARS WITH A DETACHABLE SMALL CAMERA

Shogo Yamazaki, Tokyo, Japan, assignor to Orinox Co., Ltd., Japan

Continuation of Ser. No. 159,866, Jun. 16, 1980, abandoned, which is a continuation of Ser. No. 196,372, Jun. 16, 1978, abandoned. This application Mar. 22, 1982, Ser. No. 360,760

Int. Cl.³ G03B *17/48*

U.S. Cl. 354—79 **13 Claims**



1. Binoculars with a detachable camera comprising a camera assembly having a camera body and camera lens means with an elongated camera barrel extending from the camera body, and a binoculars assembly having first and second binocular barrels with parallel optical axes and an elongated annular axle connected to the binocular barrels for adjusting relative positions of the barrels, the axle being positioned between the binocular barrels and being offset from a plane or planes containing the binocular optical axes, the axle being axially parallel to the binocular barrels and being hollow and having an inner size sufficient for selectively receiving the camera barrel and insufficient for receiving at least a part of the camera body, the camera barrel being removably received within the annular axle with an optical axis of the camera barrel parallel to the binocular optical axes, and wherein means are provided for selectively holding the camera barrel within the axle, thereby detachably connecting the camera assembly to the binoculars assembly, wherein the camera barrel comprises a camera-side barrel for joining to the camera and a remote barrel for detachably joining axially to the camera-side barrel remote from the camera body, the annular axle having annular inner bearing means for holding the camera-side barrel therein, the camera barrel having a distal end projecting through the axle and the distal end having first threaded joining means thereon, and the remote barrel having a proximal end with second threaded joining means thereon for joining the first threaded joining means on the camera side barrel portion extending from the axle, and the proximal end of the remote barrel having means for abutting the axle to firmly fix the barrels and the camera to the axle.

4,445,767

FOCUS DETECTING CAMERA

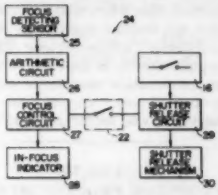
Mitsuo Kawazoe, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Jan. 12, 1983, Ser. No. 457,379

Claims priority, application Japan, Apr. 30, 1982, 57-63170[U]

Int. Cl.³ G03B *13/02*

U.S. Cl. 354—195.1 **13 Claims**



1. A focus detecting camera, comprising:

(A) an automatic focus detector for generating an in-focus detection signal when a moving object to be photographed reaches an in-focus position which is a preset distance from said camera;

(B) a human actuable switch which may be actuated by a user of said camera whenever said camera is to be operated in a moving object focus mode; and

(C) shutter release means for releasing a shutter of said camera whenever said human actuable switch is actuated and said automatic focus detector generates said in-focus detection signal.

4,445,768

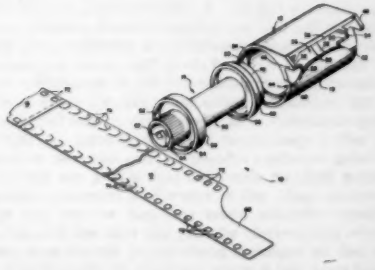
PHOTOGRAPHIC FILM ASSEMBLAGE WITH IMPROVED LEADER

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 14, 1982, Ser. No. 388,421

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 **2 Claims**



1. A photographic film assemblage comprising:

a housing for rotatably supporting a film spool having a length of photographic film coiled thereabout, said housing including means defining an opening through which the film may be advanced to the exterior of said housing;

a film spool rotatably mounted within said housing;

a length of unexposed photographic film coiled about said film spool, said film having trailing and leading ends; and

an opaque leader formed from a resilient material, said opaque leader having a trailing end secured to said leading end of said film, said leader extending from said leading end of said film and defining at least an inner convolution and an outer convolution about said coiled film, said leader including means defining a series of integral tabs in

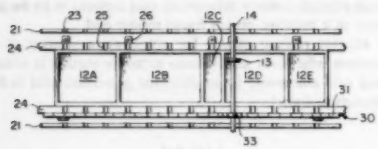
said inner and outer convolutions of said leader, said tabs in said inner convolution of said leader being substantially maintained in the plane of said inner convolution by said outer convolution of said leader thereby substantially preventing the passage of light through said inner convolution, said tabs being adapted for sequential movement out of the plane of said leader by an apparatus of a camera thereby leaving apertures in said leader for accommodating the apparatus, said tabs being tapered in the direction in which said leader is adapted to be uncoiled from said film spool such that when said tapered tabs in said outer convolution are located slightly out of the plane of said outer convolution thereby leaving tapered apertures in said outer convolution, at least one of said tapered tabs in said inner convolution may enter one of said tapered apertures in said outer convolution thereby deterring clockspringing of said leader and said film.

4,445,769

APPARATUS FOR PROCESSING FILM DISCS

Oscar Fisher, Box 949 Ohayo, Mountain Rd., Woodstock, N.Y. 12498

Filed Sep. 30, 1982, Ser. No. 430,787
Int. Cl.³ G03D *3/04, 3/08*
U.S. Cl. 354—322 **2 Claims**



1. An apparatus for processing film discs carried in stacked arrays on respective rods, which comprises a base means which supports a plurality of trays each containing a solution used in the processing, said trays being aligned along a given path extending from an input end to an output end; shift means operable to engage said rods and carry same with film discs thereon stepwise along said path, to correspondingly position in sequence the film discs in said solution-containing trays for processing thereby; and spinner means disposed to rotatably drive said rods and impart thereto a spinning motion whereby said film discs are wetted about their entire periphery when positioned in said trays; said shift means including at least one bar that extends lengthwise along said path and is disposed to engage a plurality of said rods to move same in unison along said path in spaced-apart relation therealong; said shift means bar being movable cyclically to carry said rods stepwise in a forward direction about said path during one portion of its movement cycle, and to return to a reference position in a backward direction about said path without said rods, to thereby progressively advance said rods and film discs along said path for sequential processing by the solutions contained in said trays, and wherein said trays are disposed in a row in adjoining relation along said path, and said trays have respective lengths along said path corresponding to the relative processing time for said film discs in the solutions contained in said trays.

4,445,770

FILM PROCESSOR

John B. Morse, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1983, Ser. No. 471,224
Int. Cl.³ G03B *5/06, 1/02*
U.S. Cl. 354—303 **9 Claims**

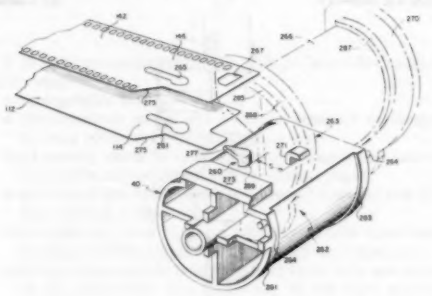
1. Processing apparatus for superposing a photographically exposed length of film having a leader containing two apertures therein with a length of sheet material having a leader so as to initiate the formation of a visible image, said apparatus comprising:

a housing defining a lighttight enclosure in which photographically exposed film is adapted to be processed, said housing including means providing access to said enclosure;

means for locating a container having a length of sheet material therein, the sheet material having a trailing end secured to a rotatable member located within the container and a leader having a first aperture therein;

means for supporting a cassette containing a roll of photographically exposed film, the film including a trailing end secured to a rotatable member located within the cassette and a leader having first and second apertures therein;

a spool rotatably supported within said enclosure, said spool including first means to which the leaders of the film and sheet material are to be attached via their first apertures, and second means to which the leader of the film is to be attached by its second aperture;



means for rotating said spool in a first direction so as to wind a laminate comprising the film and sheet material in superposition upon said spool with a layer of processing liquid located between the film and sheet material for a period of time sufficient for a visible image to form in the laminate, said rotating means being further constructed to subsequently drive the rotatable members in the sheet material container and the cassette so as to unwind the laminate from said spool thereby causing said spool to rotate in a second direction while simultaneously rewinding the sheet material into its container and the film into its cassette; and

said first means of said spool being constructed so as to move out of the first aperture in both the sheet material leader and the film leader when the laminate has been completely unwound from said spool while said second means is constructed to maintain its attachment with the film leader via the second aperture therein, whereby the sheet material is free to be completely returned to its container upon continued rotation of its rotatable member while the film is prevented from being completely returned to its cassette.

4,445,771

DEVELOPING APPARATUS FOR ELECTROSTATIC PHOTOGRAPHY

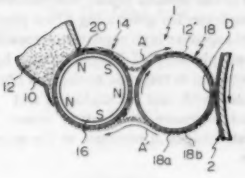
Koji Sakamoto, and Kazuo Kobayashi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 326,098
Claims priority, application Japan, Dec. 5, 1980, 55-170846; Dec. 12, 1980, 55-174610; Dec. 30, 1980, 55-158726
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **11 Claims**

1. A developing apparatus for electrostatic photography

which feeds a developer from a reservoir to a predetermined developing station to develop a latent image electrostatically formed on a moving photoconductive member into a visible image, comprising:

(a) a conveying means for conveying a roughly regulated volume of the developer from the reservoir toward the developing station, the developer being of a one component type which consists of a toner only; and



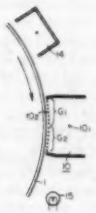
(b) a charging means for charging the toner to a predetermined polarity by frictional contact therewith while the toner is conveyed toward the developing station by the conveying means, whereby the charged toner is adhered to the charging means by electrostatic attraction to form an evenly charged toner layer having a relatively small uniform thickness.

4,445,772

ELECTRONIC PHOTOGRAPHING DEVICE

Takao Aoki, Abiko, and Takahiro Inoue, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,918, Apr. 21, 1980, abandoned. This application Jul. 28, 1982, Ser. No. 402,538
Claims priority, application Japan, Apr. 27, 1979, 54-52413
Int. Cl.³ G03G *15/02*
U.S. Cl. 355—3 CH **10 Claims**



3. An electrophotographic apparatus, comprising:

a movable photosensitive member essentially consisting of a conductive layer, a photoconductive layer and an insulating layer;

a primary corona discharger for applying corona of a predetermined polarity onto said photosensitive member;

a secondary corona discharger for applying corona having a component of the polarity opposite to the predetermined polarity, said secondary corona discharger having first and second control grids arranged side by side and in a face-to-face relation with said photosensitive member, said first grid being positioned upstream in relation to said second grid with respect to the direction of movement of said photosensitive member and having a first bias voltage applied thereto, and said second grid having a second bias voltage applied thereto which is different from said first bias voltage, wherein said corona wire is aligned with said first control grid or aligned in an area between the first and second control grids, and said secondary corona discharger having an optical opening through which said photosensitive member is exposed to image light;

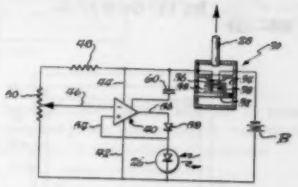
means for exposing said photosensitive member to image light through said optical opening so that a peak of light intensity distribution of the image light is aligned with the first control grid or with the area between said first control grid and said second control grid.

4,445,773

EXPOSURE INDICATOR

William B. Birkett, 42227 Sunnydale La., Northville, Mich. 48167

Filed Sep. 29, 1982, Ser. No. 428,265
Int. Cl.³ G03B *27/74*; G01J *1/42*
U.S. Cl. 355—68 **6 Claims**



1. In photographic plate makers of the type having a bed for supporting unexposed films or plates; a source of illumination for exposing said films or plates; the improvement of indicator means supported on said bed for signaling that an exposure has taken place, comprising:

comparator means for developing an output signal when a first input thereto exceeds a predetermined value;

a light emitting diode responsive to illumination from said source for developing a reverse current flow to provide said first signal and forward biased by said output signal to cause emission of radiation therefrom; and

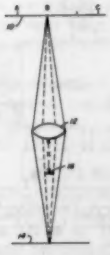
said output signal providing feedback to said first input to maintain the light emitting diode in a forward biased, light emitting state.

4,445,774

DOCUMENT IMAGING SYSTEM WITH IMPROVED EXPOSURE UNIFORMITY AT IMAGE PLANE

Richard A. Spinelli, Rochester, and Edwin F. Glab, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1982, Ser. No. 373,463
Int. Cl.³ G03B *27/72*
U.S. Cl. 355—71 **6 Claims**



1. An imaging system for projecting an image of a document lying in an object plane onto a photosensitive image plane, said system including:

a projection lens;

means for illuminating said document during an exposure

mode of operation and for directing images of said document along an optical axis towards the entrance pupil of said lens; and

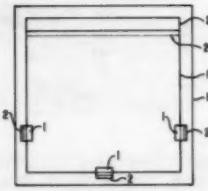
at least one uniformly opaque illumination corrector positioned between said object and image planes said corrector adapted to selectively vignette energy emanating from said field of view so as to provide a uniform exposure level at the image plane.

4,445,775

REGISTRATION BLOCKS FOR A PHOTOMASK ASSEMBLY

Richard R. Tongel, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1982, Ser. No. 362,693
Int. Cl.³ G03B *27/04*
U.S. Cl. 355—122 **20 Claims**



1. A precisely registerable assembly for use in a photolithographic imaging process which comprises:

a. a first rigid plate to which are affixed a plurality of registration blocks about the perimeter thereof; and

b. a second plate to which are affixed an equal number of block stops positioned to engage said registration blocks when said plates are brought into facing spaced relationship,

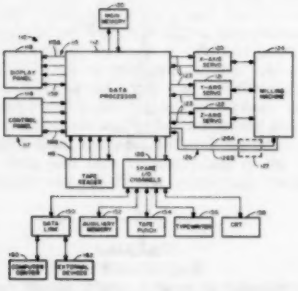
wherein the number of blocks and stops is sufficient to prevent relative lateral movement of the plates in their respective planes.

4,445,776

HIGH RESISTRATION PHOTOMASK MACHINE AND COMPUTERIZED NUMERICAL CONTROL SYSTEM

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Filed Sep. 29, 1980, Ser. No. 191,566
Int. Cl.³ G03B *27/02*
U.S. Cl. 355—78 **20 Claims**



1. A photographic exposure system comprising:

a command device for generating an input command signal;

an integrated circuit read only memory for storing command information;

an integrated circuit alterable memory for storing processed information;

a processor for processing the information stored in said alterable memory in response to the input command signal from said command device under control of the command information stored in said read only memory;

a control circuit for generating a control signal in response to the processing of information with said processor;

a machine for exposing an illumination sensitive medium in response to the control signal, said machine including

a. a photoplotter for generating a first plurality of images,

b. contact exposure high registration means for generating a second plurality of images having high registration therebetween in response to the first plurality of images generated with said photoplotter, and

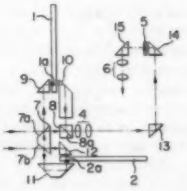
c. contact exposure duplication means for generating duplicate images in response to the second plurality of images.

4,445,777

OPTICAL SYSTEM OF A THEODOLITE

Yuzuru Ishikawa, and Masashi Tanaka, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 215,342, Dec. 11, 1980, abandoned.
This application Jan. 17, 1983, Ser. No. 458,707
Claims priority, application Japan, Dec. 27, 1979, 54-171446
Int. Cl.³ G01C *1/00*
U.S. Cl. 356—139 **9 Claims**



1. An optical system of a theodolite comprising:

(a) an altitude angle scale plate having an altitude angle scale;

(b) a horizontal angle scale plate having a horizontal angle scale;

(c) a light path combining member for combining the light paths from said two scale plates;

(d) a rectangular prism member provided between one of said two scale plates and said light path combining member and having slant faces orthogonal to each other, outer surfaces and inner surfaces of said two slant faces of said rectangular prism member being reflecting surfaces, a light beam reflected on the one of said outer reflecting surfaces illuminating said one of said two scale plates, and then being reflected by said inner reflecting surfaces and thereafter reaching said light path combining member;

(e) an objective lens for forming the images of the scales on said two scale plates; and

(f) a focusing screen on which the images of said scales by said objective lens are formed.

4,445,778

METHOD OF AND APPARATUS FOR MEASURING SCENE BRIGHTNESS

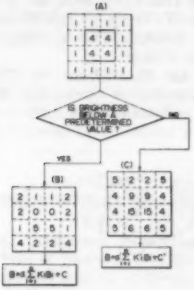
Kenji Nakauchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1980, Ser. No. 218,566

Claims priority, application Japan, Dec. 21, 1979, 54-166692; Jan. 10, 1980, 55-1641; Jan. 11, 1980, 55-1921; Jan. 11, 1980, 55-1922; Jan. 21, 1980, 55-5445

Int. Cl.[3] G01J *1/44*

U.S. Cl. 356—222 3 Claims



1. Apparatus for measuring the scene brightness of subject matter to be photographed, the apparatus comprising lens means for focusing an image of a scene including said subject matter; a plurality of photodetectors arranged over an area of the image of the scene focused by said lens means, with one or more of said photodetectors being arranged in a central portion and others thereof in a marginal portion of said image; weighting means including a plurality of groups of weighting resistors, the resistors of each of said groups being at least selectively coupled to receive associated outputs of said photodetectors, with said weighting resistors having values selected for differently weighting the outputs of the associated photodetectors in accordance with the relative positions of the latter; summing means having an input connected to the other ends of the resistors of at least a selected one of said groups thereof for summing the weighted outputs of said photodetectors to produce a scene brightness output; classifying means for classifying the scene into one of at least a normal light scene and a back light scene based on the difference between the weighted outputs of the photodetectors of said central portion and the weighted outputs of the photodetectors of said marginal portion, and providing a classification output; and selecting means for selecting, in response to said classification output, the scene brightness output as weighted by a selected one of said groups of weighting resistors.

4,445,779

DITHER SYSTEM FOR A SPRING MASS SYSTEM

Allan P. Johnson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 6, 1981, Ser. No. 280,954

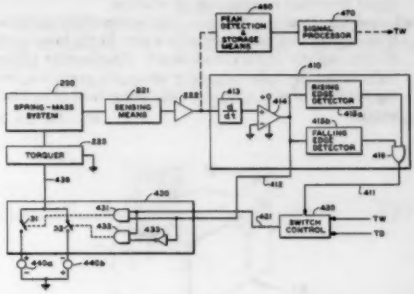
Int. Cl.[3] G01C *19/64;* G05B *13/02*

U.S. Cl. 356—350 27 Claims

1. A dither motor system for oscillating a spring-mass system in a rotational mode having controlled clockwise and counterclockwise peak amplitudes of rotation in response to an amplitude control signal, the dither motor system comprising:

pulsing means responsive to said amplitude control signal for providing torque command pulses synchronized to a selected condition of motion of said spring-mass system, said torque command pulses having a magnitude of electrical energy directly related to said amplitude control signal;

torquing means coupled to said spring-mass system for applying a controlled torque to said spring-mass system so as to separately control said clockwise and counterclockwise rotations of said spring-mass system, said torquing means



having input terminal means adapted to receive said torque command pulses wherefrom the magnitude of said controlled torque is substantially determined.

4,445,780

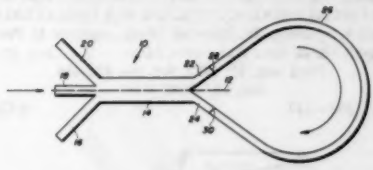
FIBER OPTIC ROTATION-SENSING GYROSCOPE WITH (3×2) COUPLER

William K. Burns, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1982, Ser. No. 353,677

Int. Cl.[3] G01C *19/64;* G02B *5/14*

U.S. Cl. 356—350 23 Claims



1. A Sagnac rotation-sensing apparatus comprising:

an interferometer including an optical coupler with three input waveguides and two output waveguides wherein said input waveguides are disposed so that two outer input waveguides are positioned about a middle input waveguide, said interferometer also including a fiber-optic loop with the ends of said fiber-optic loop optically coupled between said output waveguides of said optical coupler;

means for introducing a light beam, into said middle input waveguide, to propagate toward the ends of said fiber-optic loop; and

means for measuring the intensity of light beams, propagating away from the ends of said fiber-optic loop, in said outer input waveguides.

4,445,781

POST MIX DISPENSING METHOD AND APPARATUS

Alan J. Arena, Chino; Edwin Pounder, LaCanada; Michael Pawlowski, Chino, and Adrian M. Totten, El Monte, all of Calif., assignors to Signet Scientific Co., El Monte, Calif.

Filed Feb. 26, 1982, Ser. No. 352,754

Int. Cl.[3] B01F *15/02*

U.S. Cl. 366—154 17 Claims

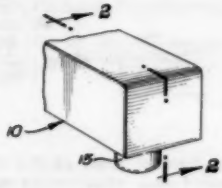
1. Post mix dispensing apparatus for dispensing a first, charged liquid and a second liquid comprising:

means defining a staging chamber;

means defining a plurality of ports spaced around the periphery of the staging chamber for injecting a first, charged

liquid into the staging chamber such that the liquid circulates turbulently in the chamber at substantially atmospheric pressure, a portion of the gases dissolved in the liquid therefore coming out of solution;

wherein the means defining a staging chamber includes a bottom wall and means defining a port in the bottom wall for porting the liquid circulating in the chamber substantially under the force of gravity alone, the port straightening the flow of the liquid and dissipating most of its kinetic energy;



means for forming a stream of a second liquid; and

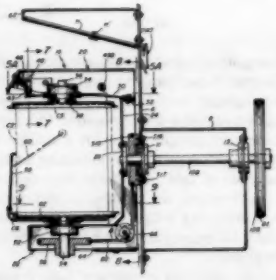
nozzle means having an opening for discharging the stream of the second liquid and the charged liquid ported from the staging chamber, the opening having a crosssectional area substantially larger than that of the means for forming the stream of the second liquid, the nozzle means directing the charged liquid to mix with the stream of the second liquid.

4,445,782

APPARATUS FOR SHAKING CONTAINED MIXTURES INCLUDING PAINT AND OTHER FLUID MATERIALS

Richard S. Sparrow, Jr., Norwell, Mass., assignor to Pecrless Pressed Metal, Inc., Watertown, Mass.

Filed Aug. 27, 1982, Ser. No. 412,436
Int. Cl.³ B01F *9/00*
U.S. Cl. 366—217 **6 Claims**



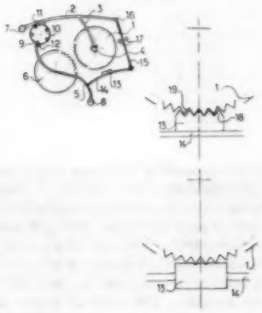
2. Apparatus for shaking a container provided with a bail and in which is received a fluid mixture including paint and other fluid materials, said apparatus including a housing having a vertical retaining wall rigidly secured at an intermediate portion thereof, a locking handle guide and stop structure fastened to the top of the retaining wall at one side thereof, a drive support structure mounted at an opposite side of the retaining wall at a lower point thereon, power driven motor and shaft means about a horizontal axis and having end portions extending through the vertical retaining wall, U-shaped holder frame means secured to the said end portions of the power driven shaft means for rotation therewith, said U-shaped holder frame means comprising a top section, a bottom section and a vertical rear side extending therebetween in which the said end portions of the shaft means is anchored, a lower clamping disk rotatably supported in the bottom section for receiving said container thereon, an adjustable upper clamping disk rotatable in the top section and movable into and out of resiliently maintained engagement with the said container supported on the said lower clamping disk, said adjustable clamping disk including a resilient suspension arm having a bearing member supported therein, a stub shaft fixed to the adjustable clamping disk freely rotatable in the bearing and means for moving the adjustable clamping disk into and out of engagement with the container.

4,445,783

SYSTEM FOR THE CONTROL OF A WHEEL FOR DRIVING IN ROTATION A CHRONOGRAPH HAND

Raymond Dodane, Besancon, France, assignor to Montres Dodane-Precia-Gete, France

Filed Apr. 20, 1982, Ser. No. 370,259
Claims priority, application France, Apr. 23, 1981, 81 08116
Int. Cl.³ G04F *3/00*
U.S. Cl. 368—105 **6 Claims**



1. A system for the control of a wheel for driving in rotation a chronograph hand, comprising a pivotally mounted lever for returning the hand wheel to zero and including a return-to-zero hammer adapted to co-operate with a heart-shaped cam jointly movable in rotation with the hand wheel, a pivotally mounted rocker for coupling an intermediate wheel rotatably mounted thereon with said hand wheel, a rotatable column wheel for controlling said lever and said rocker and a device for locking said hand wheel when said column wheel has rotated over a certain angle, wherein said locking device includes a locking shoe mounted on a support constituted by an arm attached at one end to the coupling rocker and connected at its other end to the return-to-zero lever by a releasing lever, so that the engagement of the locking shoe with the hand wheel results from the simultaneous movement of the rocker and the return-to-zero lever away from the hand wheel when said column wheel has rotated over said certain angle.

4,445,784

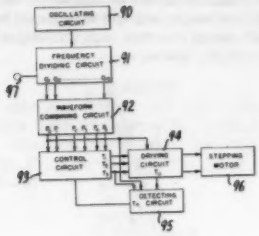
ELECTRONIC TIMEPIECE

Masaharu Shida; Makoto Ueda; Akira Torisawa; Shuji Owada, and Masaaki Mandai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Division of Ser. No. 966,115, Dec. 4, 1978, Pat. No. 4,326,278.
This application Mar. 12, 1982, Ser. No. 357,577
Claims priority, application Japan, Dec. 2, 1977, 52-144651
Int. Cl.³ G04F *5/00*; G05B *19/40*
U.S. Cl. 368—157 **10 Claims**

1. In a driver circuit for a stepping motor having a coil, a stator and a rotor, and receptive of pulse signals from a pulse signal generator to rotationally drive said rotor, the improvement wherein said driver circuit comprises means for detecting a voltage induced in said coil by momentarily connecting said coil to a high impedance element soon after application of a

pulse signal from said pulse signal generator, and means for comparing the induced voltage in said coil with a predeter-



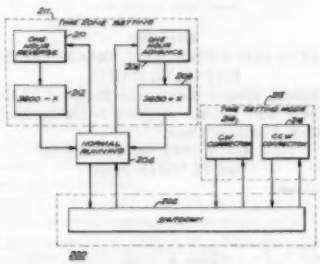
mined voltage and providing a corresponding output signal indicative of whether or not said rotor has undergone incremental rotation in response to the applied pulse signal.

4,445,785

ELECTRONIC TIME SETTING FOR A QUARTZ ANALOG WATCH

Jean P. Chambon, Montfaucon; Jean-Francois Dufay; Paul Grand Chavin, both of Besancon; Georges J. Perrin, Thise, and Louis Vernay, Besancon, all of France, assignors to William C. Crutcher, Waterbury, Conn.

Filed Jul. 12, 1982, Ser. No. 397,638
Int. Cl.[3] G04C 9/00; G04F 5/00
U.S. Cl. 368—187 **2 Claims**



1. An electronic analog timepiece having a plurality of time correction circuits each providing time correction signals for producing alternately clockwise and counterclockwise time correction rotation of at least one time indicating member when the timepiece is in one of a plurality of operating modes comprising:

(a) switch means for independently selecting one of said operating modes for controlling said time correction circuits for producing said time correction signals,

(b) motor control means responsive to said time correction signals for producing at least one series of impulse signals,

(c) a high speed stepping motor capable of operating at a speed of as high as 1,000 Hz electrically coupled to said switch means and responsive to said impulse signals from said motor control means for producing high frequency pulsed signals to provide time correction rotation of at least one time indicating member,

(d) deceleration ramp means electrically coupled to said stepping motor and responsive to said time correction signals for reducing the speed of said high speed motor, and

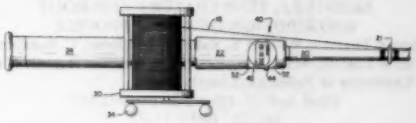
(e) counter means electrically coupled to said deceleration ramp means and responsive to said impulse signals from said motor control means for starting said deceleration ramp prior to the stopping of said high speed stepping motor.

4,445,786

ELAPSED TIME ROD AND REEL APPARATUS

Ronnie L. Jackson, DET 193-1, PSC Box #1348, APO New York, N.Y. 09289

Filed Sep. 30, 1982, Ser. No. 430,824
Int. Cl.[3] G04B 47/00
U.S. Cl. 368—10 **10 Claims**



1. In combination with fishing equipment including a fishing rod, a fishing reel with line, and a lure with hook at the free end of said line, the improvement comprising:

timing means for said fishing equipment;

means for mounting said timing means on said fishing equipment in a position which is easily viewable by the user of the equipment; and

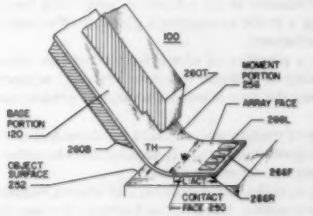
additional means for effecting starting and stopping of said timing means to indicate the elapsed time necessary to land a fish after hooking the fish by the lure with hook.

4,445,787

SURFACE TEMPERATURE MEASURING DEVICE WITH REVERSIBLE THERMOCHROMIC FILM

Robert Parker, 411 Rolling Hills La., Alamo, Calif. 94507

Filed Apr. 5, 1982, Ser. No. 365,763
Int. Cl.[3] G01K 1/16, 11/12
U.S. Cl. 374—141 **18 Claims**



1. A heat responsive device for measuring the surface temperature of an object, comprising:

a thermally conductive thin member formed by an end portion, having a contact side and an opposed indicator side, and a flexible resilient portion;

the contact side adapted to be placed into heat transfer engagement with the object surface defining an active heat transfer area on the contact side and a thin active volume within the portion of the thin member adjacent thereto, heat from the object simultaneously flows across each portion of the active area into each adjacent portion of the active volume for causing the entire active volume to uniformly increase in temperature and to simultaneously obtain an equilibrium temperature substantially equal to the temperature of the object surface;

reversible thermochromic material forming a thin layer on the indicator side of the thin member end portion, and responsive to the heat within the thin member at a critical temperature determined by the composition of the material for indicating the temperature of the thin member end portion;

support means for supporting the thin member; and

the flexible resilient portion of the thin member extending between the end portion thereof and the support means, which bends as the end portion engages the object surface to provide a constant bending moment for urging the contact side of the end portion into engagement with the object surface, and for providing a constant heat transfer pressure therebetween.

4,445,788

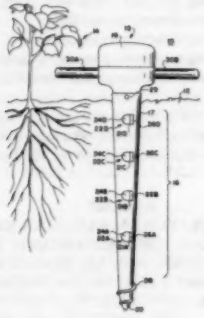
SOIL PROBE AND METHOD OF OBTAINING MOISTURE, TEMPERATURE AND ROOT DISTRIBUTION OF A SOIL PROFILE

Marvin Twersky; William E. Splinter, and Bruce C. Sandhorst, all of Lincoln, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Apr. 30, 1982, Ser. No. 373,447

Int. Cl.³ G01K *11/12*

U.S. Cl. 374—142 **25 Claims**



1. A method of determining characteristics of a substance at different locations in the substance comprising the steps of:

inserting a probe containing a plurality of sensors on it into the substance;

sensing a plurality of characteristics of the substance at a plurality of different locations with said sensors;

collecting the data from said sensors at predetermined locations;

the step of sensing said plurality of characteristics including the step of simultaneously sensing said characteristics with at least two of said sensors;

the step of collecting data from said sensors includes the step of transmitting data from said sensors to a location outside of said substance;

the step of sensing a plurality of characteristics further including the steps of sensing the temperature of said substance;

sensing the moisture of the substance; and

sensing the root growth of plant life in the substance.

4,445,789

THERMOMETER OR OTHER INSTRUMENT ASSEMBLY

Edward L. Peart, Arden, and Charlie J. Howard, Fairview, both of N.C., assignors to Sybron Corporation, Rochester, N.Y.

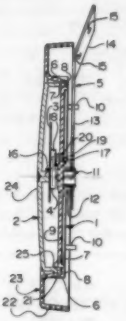
Filed May 28, 1982, Ser. No. 382,995

Int. Cl.³ G01K *5/68*

U.S. Cl. 374—198 **15 Claims**

1. An instrument assembly comprising a movement, case structure, crystal structure, and adjustment means said movement comprising condition responsive means, an indicator means having pointer means and scale means, said condition responsive means being responsive to said condition for moving one of said pointer means and said scale means with respect to the other thereof along a given path such that the relative positions thereof along said path indicate values of said condition;

said pointer means and said scale means being mounted one in said case structure and one on said crystal structure, and both said pointer means and said scale means being visible through said crystal structure such that said relative positions are exteriorly visible;



said crystal structure being movably mounted in said case structure by said adjustment means, said adjustment means including means having interdigitated digital elements normally fixing said crystal structure in position, but yielding to a sufficient quantum of force manually exerted on said crystal and along said path such as to constrain said crystal to move freely for only a discrete amount corresponding to one or several of said digital elements.

4,445,790

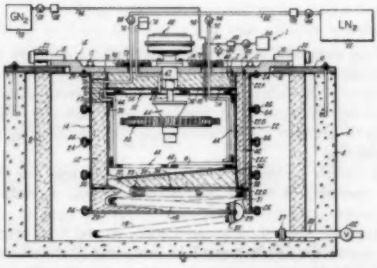
APPARATUS FOR CRYOGENIC PROOF TESTING OF ROTATING PARTS

John F. Schratt, Riviera Beach, and Joseph J. Weber, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 7, 1982, Ser. No. 366,115

Int. Cl.³ G01N *25/00*

U.S. Cl. 374—45 **7 Claims**



1. An apparatus for testing a spinning metal part at a desired cryogenic temperature, said apparatus having a container, said container having an inner container wall, cover means for said container, means for mounting a metal part for spinning within said inner container wall, a metal part mounted on said mounting means, means for filling said inner container wall above said metal part with a cryogenic liquid to bring said metal part mounted thereon to a desired cryogenic temperature, means located adjacent said inner container wall to maintain the desired cryogenic temperature within said inner container wall, means for draining said cryogenic liquid from said inner container wall when said metal part has reached the desired

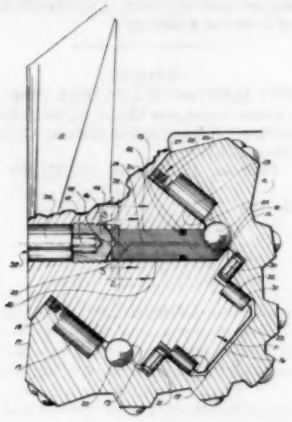
cryogenic temperature, means for placing a vacuum in said inner container wall around said metal part when said cryogenic liquid has been drained therefrom, means for spinning said metal part in said vacuum in said inner container wall to place a desired stress on said metal part when it is at the desired cryogenic temperature.

4,445,791

ROTARY DRILL BIT BALL PLUG

Frank J. Klima, 1401 W. Chestnut St., Virginia, Minn. 55792

Filed Sep. 30, 1982, Ser. No. 429,495
Int. Cl.³ F16C *33/30, 33/64;* E21B *10/22*
U.S. Cl. 384—96 **4 Claims**



1. In a rotary drill bit of the class including a rotary cutter operable on a journal on a leg of the bit and rotatably retained thereon by a plurality of ball bearings disposed between complementary configured and disposed races in said cutter and said journal, a locking, removable ball bearing retaining plug comprising, in combination;

an access hole extending through the leg and journal of a drill bit into a ball bearing race in said journal, said access hole having an inner section of a first diameter disposed about a first center line and adjacent a ball bearing race and an outer section of larger diameter formed about a center line that is offset from the center line of said inner section; and

a ball plug having an inner portion of the same diameter as the inner portion of said access hole and an outer head portion of the same diameter as the outer portion of said access hole and offset from the inner portion of said ball plug.

4,445,792

VARIABLE PRELOAD FOIL BEARING

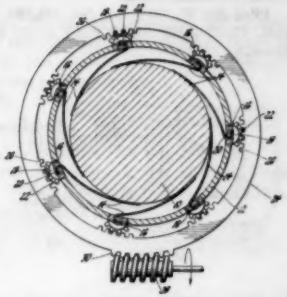
Richard J. Trippett, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,196
Int. Cl.³ F16C *32/06, 23/02*
U.S. Cl. 384—103 **2 Claims**

1. In a hydrodynamic foil bearing of the type having an axial shaft rotatably supported with respect to a housing by a plurality of cantilevered foils bearing against the shaft surface, means for adjustably mounting the foils with respect to the housing to vary the preload of the foils against the shaft surface, comprising,

a plurality of axially extending foil mounts rotatably supported relative to the housing and concentrically arranged about the shaft, each mount having a foil attached thereto to cantilever the foils to the housing, each mount having a driven portion,

a drive mechanism rotatably supported relative to the housing and engageable with the driven portions of the foil



mounts to simultaneously rotate the mounts relative to the housing and vary the preload of the foils against the shaft surface,

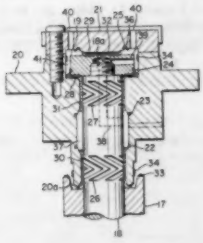
and means for releasably holding the drive mechanism in any rotative position thereof relative to the housing.

4,445,793

BEARING

Kazuyoshi Shinohara, Okayama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 17, 1982, Ser. No. 419,582
Claims priority, application Japan, Sep. 18, 1981, 56-148567
Int. Cl.³ F16C *33/74*
U.S. Cl. 384—130 **20 Claims**



1. A bearing comprising:

two members having adjacent opposing surfaces which are movable relative to each other;

a plurality of grooves formed on at least one of said surfaces,

a lubricant held between said plurality of grooves and the other of said opposing surfaces, said plurality of grooves comprising a row of grooves oriented to cause said lubricant to flow in a desired direction when said surfaces move relative to each other,

there being a first gap between (i) a portion of said at least one of said surfaces having said plurality of grooves formed thereon and (ii) the other of said opposing surfaces, which is smaller than a second gap between (a) other portions of said at least one of said surfaces which do not have said plurality of grooves thereon and (b) opposing surface portions of said other of said opposing surfaces; and

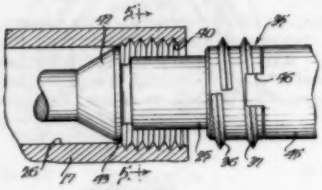
an oil repellent layer applied to at least one of said surfaces adjacent said first gap.

4,445,794

SELF-LOCKING THREADED BEARING AND BEARING ASSEMBLY AND METHOD OF MAKING SUCH ASSEMBLY

Christopher T. Sandberg, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Jul. 16, 1982, Ser. No. 398,954
Int. Cl.³ F16C *35/02*; B23P *11/00*; E05F *11/00*; F16B *29/00*
U.S. Cl. 384—428 **9 Claims**



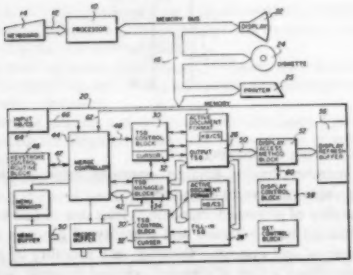
1. A self-locking threaded bearing assembly comprising, a housing having a bore with an internal thread extending along at least a part of the length of the bore, a bearing having an external thread, said threads being of the same pitch whereby the bearing can rotatably advance along the bore to a working position by interengagement of said threads, said housing threads being more ductile than the bearing threads, and the external thread of the bearing being discontinuous whereby rotation of the bearing at the working position without advance thereof causes partial stripping of the housing thread to lock the bearing axially in the housing with some of the stripped housing thread packed into the areas in which there is no bearing external thread and with parts of the external thread in contact with unstripped portions of the internal thread.

4,445,795

METHOD AND APPARATUS FOR MERGE PROCESSING IN A TEXT PROCESSING SYSTEM

Lewis J. Levine, and Kenneth O. Shipp, Jr., both of Austin, Tex., assignors to International Business Machines, Armonk, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,252
Int. Cl.³ B41J *5/30*
U.S. Cl. 400—63 **6 Claims**



1. In an interactive text processing system in which a document input by way of a keyboard is stored, displayed to an operator, and merged with other keyed data in accordance with directions supplied to said system by an operator interacting with the keyboard and a display unit, the combination which comprises:

means for signalling, by either a first or a second control code, the location in a document at which an insert of pre-stored text data is to be added to the document;

means for displaying a first menu of predetermined task selections selectable by an operator through said keyboard for selecting either a first type of merge operation operable in response to said first control code or for selecting a second type of merge operation in response to said second control code;

means for displaying, when said merge operation operable in response to said first control code is selected, a second menu of predetermined task selections for specifying the identification of a first insert of pre-stored text data;

means for displaying, when said merge operation operable in response to said second control code is selected, a third menu of predetermined task selections for specifying the identification of a second insert of pre-stored text data; and

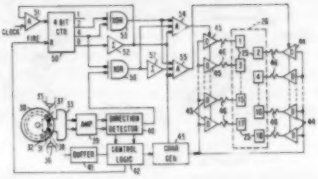
means for fetching in response to the specified identification the specified insert of pre-stored text data and merging said data into said document at the signalled location to produce a revised document.

4,445,796

PRINT ELECTRODE CONTROL CIRCUIT

Vincent M. Lisica, Vestal, and Charles O. Ross, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,804
Int. Cl.³ B41J *3/20*
U.S. Cl. 400—120 **10 Claims**



1. In a printer having a print head with at least two pluralities of print elements thereon and being movable along a print line on a record member with said pluralities moving in tandem, an energizing circuit for said print elements comprising:

data means for supplying data signals for recording to selected ones of said print elements when enabled;

means for generating sequencing signals, said generating means including a counter and means responsive to predetermined increments of motion of said print head along said print line for initiating said sequencing signals from said counter means;

enabling means responsive to predetermined ones of said sequencing signals for providing enabling signals for said data means to enable said pluralities of elements in succession with the lagging plurality being enabled first.

4,445,797

IMPACT CONTROL FOR CARRIER MOUNTED SERIAL PRINTERS

Gian P. Barozzi, and Giancarlo Horeschi, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,074
Claims priority, application Japan, Jul. 11, 1980, 55-94939
Int. Cl.³ B41J *1/60*
U.S. Cl. 400—166 **8 Claims**

1. A printing device in a typewriter comprising:

a rocker bracket turnable in a direction of printing a letter by a cam rotated when a key is pressed;

a type head vertically movably and rotatably supported by said rocker bracket;

a vertically movable pulley and a rotatable pulley which are mounted on said rocker bracket and rotated by a predetermined value in accordance with a letter selected by the key;

a mechanism for transmitting a movement of the vertically

movable pulley to the type head to vertically move the type head; and

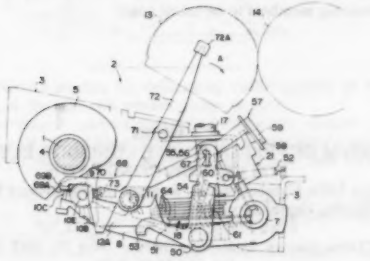
a mechanism for transmitting a movement of the rotatable pulley to the type head to rotate the type head;

wherein said printing device further comprises:

a printing arm for pivotally supporting a trigger detachably engageable with said rocker bracket and abutting against and being rotated by said cam to turn the rocker bracket;

vertical direction selecting means movable to a predetermined position in accordance with a value of rotation of the vertically movable pulley;

rotational direction selecting means provided on the rotatable pulley; and



a printing pressure control member movable in accordance with movements of the vertical direction selecting means and the rotational direction selecting means and having at least two abutting portions within a moving path of the trigger;

whereby the position of the printing pressure control member is set by said respective selecting means, and the trigger is caused to impinge on a portion selected out of the abutting portions, so that a position where the rocker bracket is to be released can be adjusted, thereby enabling the adjustment of the printing pressure.

4,445,798

SERIAL PRINTER WITH A LINEAR MOTOR PRINTER CARRIAGE

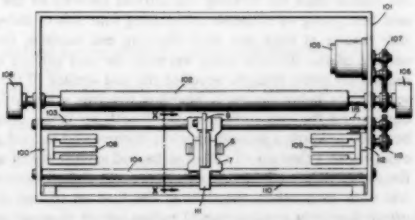
Hidehiko Munehiro, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,273

Claims priority, application Japan, Feb. 15, 1980, 55-17626; Feb. 27, 1980, 55-23550

Int. Cl.³ B41J *19/14, 19/30, 25/28*

U.S. Cl. 400—320 **5 Claims**



1. A serial printer comprising:

a printer carriage having a non-impact type print head mounted thereon,

guide means for guiding lateral reciprocation of said carriage,

roller means provided on said carriage for reducing sliding friction between said carriage and said guide means, and

a linear motor including a magnetic circuit for creating a magnetic field at an air gap, and a moving coil movable within said air gap in a direction perpendicular to said magnetic field, said moving coil being secured to said carriage,

said magnetic circuit being provided only at both end portions of said carriage reciprocation, and said carriage sliding on said guide means at a substantially uniform sliding speed over a printing stroke.

4,445,799

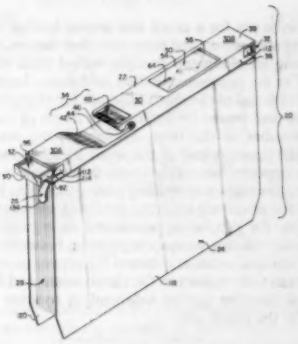
DOCUMENT HOLDERS

David M. Wright, Shrewsbury, and Albert G. Ermanski, Auburn, both of Mass., assignors to Wright Line Inc., Worchester, Mass.

Filed Feb. 12, 1981, Ser. No. 234,072

Int. Cl.³ B42F *13/00, 15/00;* **A47B** *63/00*

U.S. Cl. 402—4 **13 Claims**



1. A loose-leaf binder for use in both single- and double-horizontal-rail filing systems said binder comprising in combination:

means for releasably securing marginally perforated stationary items;

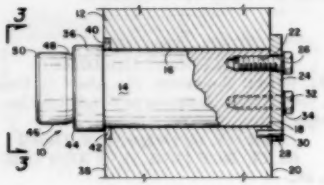
an articulated case comprising front and rear covers hinged to an included elongate spine, said spine terminating longitudinally in head- and tail- ends and being dimensioned to accommodate within said case said items securing means, and support means on said spine for aligning and laterally restraining said items securing means; and

an elongate hollow spine structure of similar length and width as said case spine and similarly terminating in head- and tail-ends, said spine structure comprising a pair of substantially parallel sides and an included back, hook means, and end means, said hook means comprising at least one hook formed in said back and said sides, and said end means including a pair of end pieces disposed at said head- and tail-ends of said spine structure with at least one of said end pieces being movable between a closed position and an opened position relative to said spine, when in said closed position said at least one end piece being fully recessed within said spine structure so as to not substantially extend beyond the associated head- or tail-end thereof, and when in said opened position said at least one end piece extending longitudinally beyond the associated head- or tail-end, said end means being further provided with means for releasably securing said end pieces in said opened position and said closed position; and means, separate from and operable independently of the end pieces, for securing the case to the spine structure;

whereby the binder may be suspended by said end pieces in

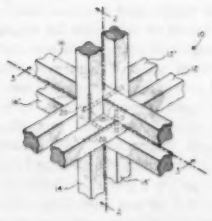
the double-horizontal-rail filing system or by said hook in the single-horizontal-rail filing system.

4,445,800
WRIST PIN
Raymond L. Walker, P.O. Box 1342, San Clemente, Calif. 92672
Filed Nov. 24, 1981, Ser. No. 324,619
Int. Cl.³ F16B *21/00*
U.S. Cl. 403—14 **4 Claims**



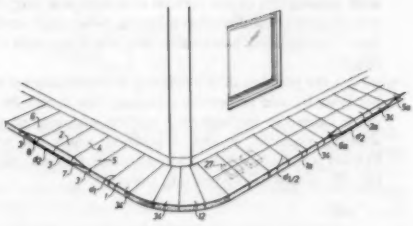
1. A wrist pin for a crank arm means having a transversely extending straight-walled bore provided therein, said wrist pin comprising an elongated straight-walled solid shank member adapted to be positioned within said bore, head means provided at one end of the shank member for engaging one face of the crank arm means for limiting the depth of insertion of the shank member in the bore, retaining plate means disposed against the opposite end of the shank member for engagement with the opposite face of the crank arm means, securing means extending through the retaining plate means and into the shank member for positively securing the shank member to the crank arm means for precluding accidental disengagement therebetween, and indexing means cooperating between the retaining plate means and crank arm means for proper orientation of the plate means with respect to the shank means and for anchoring the shank member against independent rotation thereof with respect to the crank arm.

4,445,801
DISMANTABLE JOINT ARRANGEMENT
Luc Trudeau, 880, Carleton St., Chambly, Quebec, Canada J3L 2X9
Filed Sep. 28, 1982, Ser. No. 425,856
Int. Cl.³ F16B *7/18*
U.S. Cl. 403—219 **14 Claims**



1. A dismantable joint arrangement comprising only three groups of only two members in each group, said two members of each of said groups being oriented as pairs of spaced-apart parallel members, said pairs of members being arranged relative to one another such that the members of each pair cross the members of the other pairs in abutting engagement therewith and any one pair of members has a respective second pair of members interposed therebetween and a respective third pair of members adjoined thereto and interposed between the members of said respective second pair, and at least two dowell-type coupling elements associated with each pair for positioning the members thereof against those interposed therebetween, said coupling elements being removably inserted in corresponding holes formed at the crossings of said members and being slidably frictionally engaged in said holes so as to be retained therein by frictional force while being slidably removable by the application of manual force, the members of said respective third pair cooperating with the members of said one pair and said respective second pair to stabilize the relative position of said members and the coupling elements associated with said respective second pair releasably locking the members of said respective third pair in place to thereby provide a rigid and secure joint for all said members, whereby said joint arrangement may be dismantled by slidably removing at least one of the coupling elements associated with said respective second pair so as to release at least one of the members of said respective third pair and thereby enable the remaining members to be taken apart.

4,445,802
SYSTEM OF PREFABRICATED CONCRETE ELEMENTS FOR CONSTRUCTING PATHS
Björn Lööv, Upsala, Sweden, assignor to Aktiebolaget S:t Eriks Betong, Uppsala, Sweden
Filed May 6, 1982, Ser. No. 375,567
Claims priority, application Sweden, May 25, 1981, 8103275
Int. Cl.³ E01C *5/06*
U.S. Cl. 404—40 **10 Claims**



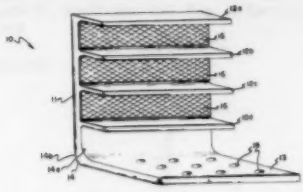
1. A combination of prefabricated concrete elements for constructing paths in the form of walks and cycle paths and the like for light traffic and having a predetermined width corresponding to normal minimal width N, the combination of prefabricated concrete elements adapted to rest on the ground and extend at least on part above the ground, comprising a first group of prefabricated concrete elements comprising flat, four-sided slabs for the straight sections of the path, and a second group of prefabricated concrete elements consisting of flat radius slabs for forming the curved sections of the path, said first group of elements comprising four sets of slabs each slab having at least one curb forming end surface, the end surface of the first set being vertical, the end surface of the second set being straight bevelled the end surface of the third set of slabs being obliquely bevelled towards a first opposite corner and the end surface of the fourth set being obliquely bevelled towards a second opposite corner; said second group comprising a first set of radius slabs and a plurality of sets of flat radius slabs each having a large arc and a small arc concentric with each other, the slabs in the first set of said second group having a predetermined radius which is equal to said normal width N, each of the remaining sets having slabs respectively which increase serially in radius equal to the radius of the immediately preceding set plus the normal minimal width N, the slabs of each set of said second group having edge portions at at least one of said arcs designed to form the outer contour of the path, providing a curb-forming effect.

4,445,803

RESILIENT MARKER

Byron P. Dixon, 4138 S. 570 East #25C, Salt Lake City, Utah 84107

Filed Dec. 17, 1982, Ser. No. 450,653.
Int. Cl.³ E01F *9/00*
U.S. Cl. 404—10 **3 Claims**



1. A reflective marker for delineating traffic control on a roadway and the like, said marker comprising:

a top assembly of resilient material having a pair of faces

a plurality of spaced apart protective flaps attached to said top assembly and cantilevered from at least one face thereof;

a plurality of reflective surfaces on each face of the top assembly having said protective flaps extending therefrom and adjacent to said protective flaps;

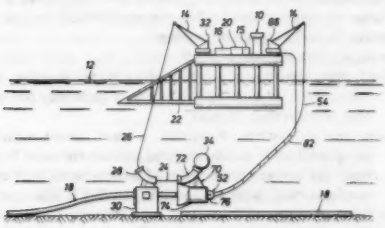
a base plate for attaching said marker to a road surface or the like, said base plate being integrally formed with the top assembly and extending substantially normal thereto.

4,445,804

METHOD AND APPARATUS FOR REMOTE RECOVERY OF SUBMERGED PIPELINES

Mohamed G. Abdallah, and William M. McDonald, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed May 28, 1982, Ser. No. 382,894
Int. Cl.³ F16L *1/04*
U.S. Cl. 405—173 **24 Claims**



9. A method for recovering a submerged pipeline, comprising the steps of:

lowering a pipe alignment frame into an operational relationship with a substantially straight segment of said pipeline by paying out an alignment cable threadingly engaged with said pipe alignment frame, said alignment cable having a first end connected to a buoy, said alignment cable also having a second end controlled from the water surface to pay out and take in said alignment cable;

paying out said second end of the alignment cable, after said pipe alignment frame is in an operational relationship with said pipeline, to enable said buoy to raise said first end of the alignment cable to the water surface;

coupling said first end of the alignment cable to a lift head means, said lift head means having a lift head connected thereto for gripping a pipeline end upon the remote activation of said lift head, said lift head means having a first end of a retrieval cable connected thereto, said retrieval cable also having a second end controlled from the water surface to pay out and take in said retrieval cable;

taking in said alignment cable while paying out said retrieval cable to lower said lift head means towards said pipe alignment frame until said lift head is in a position to grip said pipeline upon the activation of said lift head;

gripping said pipeline by remotely activating said lift head until said lift head is in a gripping relationship with said pipeline; and

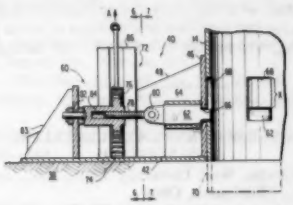
taking in said retrieval cable while paying out said alignment cable to raise said lift head means and said pipeline towards the water surface.

4,445,805

JACK-UP PLATFORM VARIABLE BEARING ASSEMBLY

Donald R. Ray, Houston, Tex., and Eugene R. Facey, London, England, assignors to Sonat Offshore Drilling Inc., Houston, Tex.

Filed Nov. 17, 1982, Ser. No. 442,463
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—203 **15 Claims**



1. A variable bearing assembly for a jack-up platform having a hull, at least one support leg operable to extend from the hull to a seabed to support the hull above the surface of the sea and means to selectively effect relative vertical movement between the hull and leg, said variable bearing assembly comprising:

bearing means, operable to surround the support leg at a distal end thereof remote from said hull when the support leg is in an extended position, for selective bearing engagement with the seabed;

at least one longitudinally elongate recess fashioned into the support leg at a position above but adjacent to the distal end of the support leg;

means, mounted on said bearing means, for engaging said at least one longitudinally elongate recess fashioned into the support leg for connecting said bearing means to the support leg and concomitantly permitting a degree of longitudinal relative motion between said bearing means and the support leg at the distal end of the support leg such that the support leg may extend into the seabed downwardly of the position of said bearing means; and means for releasing said means for engaging said at least one longitudinally elongate recess of the support leg such that the support leg may be selectively released from said bearing means on the seabed and withdrawn to the platform hull.

4,445,806

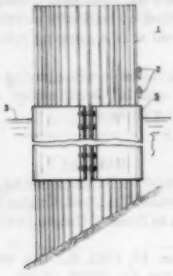
SHEET PILING OR MOORING CELL

Graydon H. Crain, Freedom Rd., R.D. #5, Mars, Pa. 16046

Filed Jul. 12, 1982, Ser. No. 397,556
Int. Cl.³ E02B *3/22*; E02D *5/60*
U.S. Cl. 405—216 **2 Claims**

1. In combination with a mooring cell structure having a corrugated cylindrical configuration; the combination therewith of a pair of arcuate metallic sheets of substantially equal length secured together in metallic contact with and directly

surrounding said cells to provide a direct mechanical reinforcing layer and extending only in the area immediately above and below a river water line, flanges secured to the ends of said sheets, a plurality of longitudinally spaced bolting means for holding together said flanges of said arcuate sheets so as to



tightly encircle the mooring cell structure and prevent loss of the contents thereof as well as to effect direct reinforcement of the cell together with vertically spaced mooring rings secured to said mooring cell structure at a position of about 90° away from said flanges to protect said flanges from damage by vessels.

4,445,807

DIVERLESS SUBSEA TEMPLATE LEVELLING SYSTEM AND METHOD

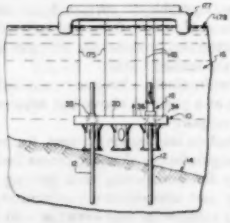
William S. Cowan, West University Place, Tex., assignor to Armco Inc., Middletown, Ohio

Continuation-in-part of Ser. No. 221,398, Dec. 30, 1980. This application Dec. 8, 1981, Ser. No. 328,791

The portion of the term of this patent subsequent to Oct. 11, 1983, has been disclaimed.

Int. Cl.[3] **E02B** *17/02*

U.S. Cl. 405—227 **23 Claims**



1. A subsea template levelling system for levelling a template adjacent the seabed on a plurality of piles implanted in a seabed, the combination comprising:

an open ended hub having a pile received therein;

means for pivotally coupling said hub to the template in a passageway in the template;

first gripping means, coupled to said hub, for releasably gripping the pile received in said hub, said first gripping means being fluid-pressure activated;

a housing;

means for releasably coupling said housing to said hub;

second gripping means, slidably received in said housing, for releasably gripping the pile received in said hub;

means on the exterior of said second gripping means and on the interior of said housing for limiting the slidable movement of said second gripping means relative to said housing;

means for unlocking and locking said first and second gripping means and for reciprocating said second gripping means relative to said housing to raise and lower the template relative to the pile received in said hub; and

means for remotely delivering fluid under pressure from a fluid reservoir at the sea surface to said first gripping means without the necessity for an underwater manual connection.

4,445,808

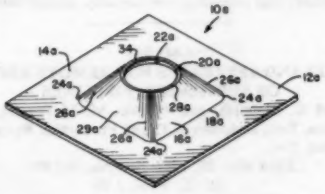
MINE ROOF PLATE

Satya P. Arya, Somerville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 99,836, Dec. 3, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 300,773

Int. Cl.[3] **E21D** *21/00*

U.S. Cl. 405—259 **8 Claims**



1. A mine roof plate, having a load-carrying capacity within a range of not less than 23,000 pounds (10432.8 kg.) to 35,000 pounds (12,247.2 kg.), comprising:

a rigid plate formed of steel;

said plate having a substantially-central portion thereof raised from, or in relief relative to, a generally flat, peripheral portion thereof; and

said central portion comprises a base, about which said peripheral portion subsists, and a dome elevated from said base, the uppermost portion of which dome is of circular configuration, with an aperture, having a diameter taken from a range of from 1.39 to 1.60-inch, formed in said dome substantially centrally thereof; wherein

said base has rectilinear sides which are joined at ends thereof through radiused, corner portions;

said plate is of a substantially uniform thickness;

said uniform thickness is not more than a maximum of approximately 0.158-inch (4.0132 mm.) to a minimum of approximately 0.121-inch (3.0734 mm.);

said central portion has sides, joining said base and said uppermost portion of said dome, which fair the linearity thereof, defined by said rectilinear sides of said base, to arcuate conformations thereof, defined by said circular configuration; whereby

successive cross-sections of said dome, from said base to said uppermost portion thereof, transform from a rectilinearly-sided, substantially square shape to a circular shape; and

said dome has a flat, terminal land surface, circumscribing said aperture, having a width dimension which is less than said maximum thickness dimension of said plate.

4,445,809

APPARATUS FOR EMPTYING CONTAINERS FILLED WITH POWDER

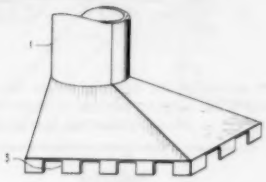
Werner Schmitz, Hasselroth, and Edgar Simon, Freigericht, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 225,821, Jan. 16, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 488,552

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004945

Int. Cl.³ B65G *53/50*

U.S. Cl. 406—152 **1 Claim**



1. In an apparatus for emptying containers filled with powder, the improvement comprising

providing a tube for emptying the powder in containers, which tube has an upper end and a lower end, the upper end having attached thereto a flexible tube, the lower end of the tube having an opening to permit entry of, and emptying of, the powder from the container,

a fluidizing device arranged near the opening at the lower end of the tube and arranged concentrically around the tube thereby defining a jacket creating a chamber between the tube and the device,

the jacket having bore holes associated therewith for introducing fluidizing air into the powder in the direction of said opening of the tube, said tube extending below the bore holes in the jacket,

the opening being of rectangular cross section with a crenelated edge and of larger cross section than the tube,

the said rectangular cross section of the opening decreasing in cross section in an upward direction toward the tube,

said fluidizing device consisting of a double conical jacket provided with a gas supply duct parallel to the tube, or a hollow spherical jacket having a gas supply duct arranged coaxially about the tube.

4,445,810

METHOD OF MAKING A CUTTING MEMBER AND ARTICLE PRODUCED THEREBY

Kurt A. Theilen, Cologne, Fed. Rep. of Germany, assignor to Lukas-Erzett Vereinigte Schleif und Fraswerkzeugfabriken, Engelskirchen, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,261

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132860

Int. Cl.³ B26D *1/00*

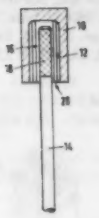
U.S. Cl. 407—118 **8 Claims**

1. A method of making a cutting member by assembling together a cutter body and an elongated shank, comprising the steps of:

providing a recess of a predetermined size in the cutter body coaxial with the shank, the recess being out-of-round in cross-section at least in part;

extending one end of the shank into the recess coaxial with the cutter body, the one end being out-of-round in cross-section at least in part and being of a size less than said predetermined size so as to define an annular gap therewith;

holding the cutter body and shank together to maintain said annular opening; and



injecting into said annular gap an alloy in a liquified condition for securely interconnecting the shank with the cutter body.

4,445,811

SETTING MECHANISMS ESPECIALLY FOR TOOLS FOR CARRYING OUT ROUTING AND LIKE OPERATIONS

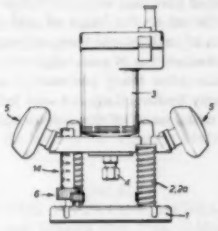
Anthony J. Sanders, Newton Aycliffe, England, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 19, 1981, Ser. No. 322,946

Claims priority, application United Kingdom, Nov. 24, 1980, 8037648

Int. Cl.³ B23C *1/20*

U.S. Cl. 409—182 **5 Claims**



1. A tool for carrying out routing and like operations, comprising:

a base plate;

a depth stop extending upwardly from the base plate, and comprising a post including a surface in the form of a toothed rack;

a first collar of generally cylindrical form movable along said post and having a bore, one portion of the surface of said bore being formed to engage one or more teeth on said rack to lock said first collar in a selected one of a number of predetermined positions along said post;

means for resiliently biasing said one surface portion of said first collar into engagement with said toothed rack;

a screw thread on the outer surface of said first collar;

a second collar having a screw-threaded bore screwed over said first collar; and

a scale connected to said second collar for movement therewith along said post, said scale having a portion disposed between said post and said second collar, and said portion comprising said resiliently biasing means;

whereby said first collar is operable to set said depth stop approximately to a desired setting and said second collar is operable to adjust the approximate setting of said depth stop accurately to a required setting.

4,445,812

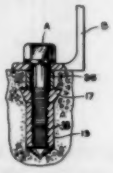
BOLT ANCHOR ESPECIALLY FOR USE IN HARD MATERIALS

John Giustino, 21 Willow Rd., Menlo Park, Calif. 94025

Continuation of Ser. No. 94,442, Nov. 15, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,740

Int. Cl.[3] F16B *13/10*

U.S. Cl. 411—57 6 Claims



1. An expandable anchor for use in a blind hole having an annular ledge a predetermined distance from the blind end comprising,

an elongated cylindrical body for insertion in a blind hole with an annular ledge, and having an axial bore with axially facing screw threads in a lower portion of the bore and with an annular axially facing solid hump in an upper section of the bore, said annular solid hump extending inwardly further than said screw threads constricting the bore, denying entry of a screw therein, and segmented by a plurality of slits, said annular hump segments having a connection to said lower bore portion which permits rotation of said hump segments radially outwardly, the outside diameter of said cylindrical body snugly fitting within a ledged hole such that said hump segments may be disposed adjacent to the ledge of said ledged hole, the cross section of said rotated hump segments substantially filling the cross section of said ledge and having a pointed region which, after hump outward rotation, faces said ledge and may be forced against said ledge for opposing turning or withdrawal of the cylindrical body from the axial bore.

4,445,813

METHOD OF FORMING SEAMLESS CONTAINER

Surya K. Misra, Naperville, and Richard A. Openchowski, Woodridge, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Continuation of Ser. No. 851,856, Nov. 15, 1977, abandoned. This application Jun. 14, 1979, Ser. No. 48,667

Int. Cl.[3] B21D *51/02*

U.S. Cl. 413—1 9 Claims

1. A method of forming a seamless drawn and ironed container having a bottom wall and an integral sidewall from a metal stock material, comprising the steps of applying a thin layer of a fatty acid ester lubricant in the range of about 1 to about 3 mg/in.^{2} thickness equivalent to one surface of said metal stock material, converting said stock material into a cup, and forming a drawn and ironed container from said stock material in a multi-staged ironing process while retaining at least some of said lubricant on said surface throughout said ironing process.

4,445,814

APPARATUS FOR DEPOSITING SOLID PARTICULATE MATERIAL IN A FRUSTOCONICAL PILE

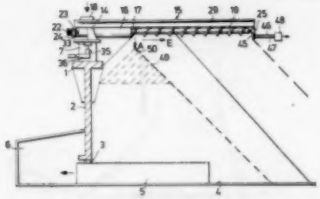
Per-Ove Malmström, Harnosand, and Karl E. A. Dyrén, Ornskoldsvik, both of Sweden, assignors to KMW-Mekan AB, Ornskoldsvik, Sweden

Filed Mar. 1, 1982, Ser. No. 353,706

Claims priority, application Sweden, Mar. 25, 1981, 8101918

Int. Cl.[3] B65G *65/30*

U.S. Cl. 414—295 9 Claims



1. Apparatus for depositing solid particulate material in a frustoconical pile within a space of predetermined dimensions comprising, in combination:

(a) a screw conveyor for particulate material arranged substantially horizontally and at a predetermined height above the pile;

(b) means for feeding particulate material to the screw conveyor;

(c) the screw conveyor having a screw conveyor housing and a screw mounted at one end of the screw conveyor housing for driven rotation and operatively disposed in the screw conveyor housing for receiving and transporting particulate material therealong from said one end to an opposite end thereof;

(d) means at said opposite end of the screw conveyor housing for depositing particulate material conveyed by the screw conveyor along the housing as a pile below the conveyor up to a maximum height corresponding to the level of the screw;

(e) the screw extending beyond said opposite end of the screw conveyor housing so as to directly engage particulate material in the pile when the height of the pile reaches the screw so that when said height is reached the screw carries particulate material at its level along the top of the pile to an outer edge thereof for deposit there, thereby leveling off the top of the pile and maintaining a frustoconical shape in the pile, while ensuring spreading of the pile of particulate material throughout and within a space of predetermined dimensions.

4,445,815

TEMPERATURE REGULATION OF AIR CYCLE REFRIGERATION SYSTEMS

William E. Fortmann, West Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 157,774, Jun. 9, 1980, Pat. No. 4,415,307. This application Sep. 30, 1982, Ser. No. 431,477

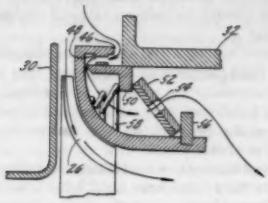
Int. Cl.[3] F01D *17/08*

U.S. Cl. 415—12 6 Claims

1. A turbine for an air cycle refrigeration system, said turbine comprising a rotor provided with a plurality of blades and a stator having fixed and adjustable portions thereof said stator receiving air through an inlet thereof, said air being expanded and cooled in said turbine and delivered from said turbine through an outlet thereof,

said turbine being characterized by an actuator disposed interiorly of said turbine, said actuator comprising a bimetallic annulus of truncated conical shape connected to said fixed and adjustable stator portions, flexure of said bime-

tallic annulus in response to the temperature of airflow through the turbine axially varying the geometry of said annulus to adjust the relative, axial disposition of said fixed



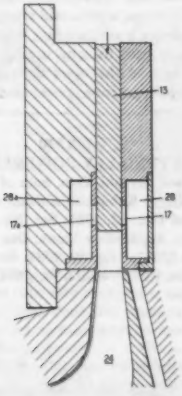
and adjustable stator portions for adjusting the airflow through said turbine, thereby varying the amount of heat removed from said airstream.

4,445,816

SUPERSONIC COMPRESSOR WITH IMPROVED OPERATION RANGE

Yves J. Ribaud, and Gilbert F. Kergreis, both of Palaiseau, France, assignors to Office National D'Etudes et de Recherches Aerospatiales, Sous-Bagneux, France

Filed Jul. 13, 1981, Ser. No. 282,608
Claims priority, application France, Jul. 16, 1980, 80 15716
Int. Cl.³ F04D *29/44*
U.S. Cl. 415—181 **8 Claims**



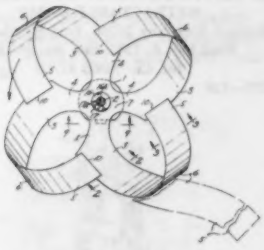
1. A supersonic centrifugal compressor, comprising:
a bladed rotor arranged to deliver fluid at an absolute velocity at least equal to Mach 1.2 under rated conditions,
and an annular radial flow diffuser at the outer periphery of said rotor, having:
a casing including spaced sidewalls and vanes between said spaced sidewalls, cooperating therewith to define intervane channels distributed angularly about an axis of said diffuser and each having a throat section located downstream of the leading edges of the channel defining vanes,
a pair of common secondary spaces formed each in one of said sidewalls,
a pair of parietal slots per channel, symmetrically formed in said sidewalls, opening into said channel, located and dimensioned to overlap said throat section in the flow direction and to have a cross-sectional flow area at least equal to half the flow area of the channel at the throat thereof,
and passage means for communicating the slots formed in a same sidewall to a same one of said common secondary spaces, the cross-sectional flow area of said passage means being at least equal to that of the associated slot throughout its length whereby the flow range is substantially increased.

4,445,817

PROPELLER CONSTRUCTION

Richard J. Wethern, 13380 SW. Farmington Rd., Beaverton, Oreg. 97005

Filed Aug. 6, 1981, Ser. No. 290,608
Int. Cl.³ B64C *11/16*
U.S. Cl. 416—227 **4 Claims**



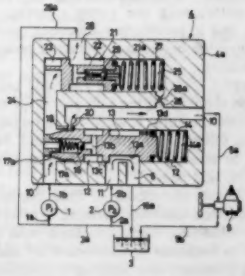
1. A propeller formed from pliable sheet material and adapted for attachment to a motor output shaft, said propeller comprising,
a planer hub portion apertured for attachment to said motor output shaft, and
blades carried by said hub portion with each blade comprising a root integral with said hub portion, a blade end, an inner segment integral with and angularly orientated to said root, each blade being of generally folded configuration so as to locate said blade end proximate the inner segment of an adjacent blade, means attaching the blade end to the inner segment of the adjacent blade at a point offset from the root of the adjacent blade.

4,445,818

APPARATUS FOR SUPPLYING HYDRAULIC FLUID

Hiroshi Ohsaki, and Takeshi Ohe, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,412
Claims priority, application Japan, Mar. 13, 1981, 56-36031
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—288 **9 Claims**



1. An apparatus for supplying hydraulic fluid comprising a first and a second pump for separately discharging a hydraulic fluid, a main passage for supplying hydraulic oil from the first pump to a hydraulic unit, a flow path switching valve disposed

intermediate the main passage and normally connecting the second pump with a tank and responsive to an increased loading on the hydraulic unit by disconnecting the second pump from the tank and connecting the second pump to the main passage, and a flow control valve disposed intermediate the main passage for returning to the tank part of the hydraulic fluid from the first pump or part of the combined hydraulic fluid from the first and the second pumps, the flow control valve being controlled by a pressure differential across a variable orifice disposed intermediate the main passage and said variable orifice having a throttle opening which changes as the flow path switching valve operates.

4,445,819

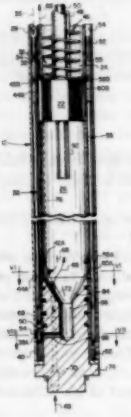
SINGLE ACTION PNEUMATIC POWERED SPRING RETRACTABLE PUMP

John B. Walling, P.O. Box 16266, Fort Worth, Tex. 76133

Filed Feb. 1, 1982, Ser. No. 344,359

Int. Cl.[3] **F04B** *47/08*

U.S. Cl. 417—318 **3 Claims**



1. A pump for producing formation fluid from a well comprising, in combination:

an elongated pump housing having an axially extending bore and means partitioning said bore thereby defining a power fluid reservoir and a pump chamber;

a guide tube extending axially into said pump chamber;

a piston rod received in slidable engagement within said guide tube;

a piston mounted on said piston rod and received within the pump chamber in slidable engagement with said bore thereby partitioning the pump chamber into a power chamber and a production chamber, said piston being axially movable between a retracted position and an extended position;

a helical spring for applying a yieldable bias force against said piston thereby urging said piston for movement from the extended position toward its retracted position, said spring encircling said guide tube and having one end attached to said partitioning means and having one end attached to said piston;

first valve means connected in fluid communication with said production chamber forming a produced fluid inlet port for admitting formation fluid into the production chamber in response to movement of said piston to the retracted position, and forming a produced fluid outlet port for discharging formation fluid out of the production chamber in response to movement of said piston to the extended position;

said second valve means opening and closing a first fluid flow path between the power fluid reservoir and the power chamber, and closing and opening a second fluid flow path between the power chamber and exhaust port means for alternately pressurizing and relieving the power chamber in response to movement of said piston to the retracted and extended positions, respectively;

said pump housing including a sidewall enclosing said pump chamber;

said sidewall having a first axially extending bore defining a power fluid charge bore, said charge bore having an inlet port communicating with the power fluid reservoir and having a delivery port communicating with the power chamber for pressurizing said power chamber during extension of said piston;

said sidewall having a second axially extending bore defining a power fluid relief bore, said relief bore having a vent port communicating with the power chamber for relieving said power chamber during retraction of said piston;

said first and second valve means including:

a first shuttle rod received in slidable engagement within the charge bore and reciprocably movable through the charge bore between a first position opening the delivery port for pressurizing the power chamber and a second position blocking the delivery port;

a second shuttle rod received in slidable engagement within the relief bore and reciprocably movable through the relief bore between a first position blocking the vent port and a second position opening the vent port for relieving the power chamber;

means carried by said first and second shuttle rods for engaging said piston whereby said shuttle rods are reciprocated from their first positions to their second positions in response to movement of said piston to the extended and retracted positions, respectively; and,

spring means received within said charge bore and said relief bore for applying a yielding bias force against the first and second shuttle rods thereby urging said shuttle rods for movement toward the open delivery port position and closed vent port position, respectively.

4,445,820

ELECTRICALLY POWERED PUMP

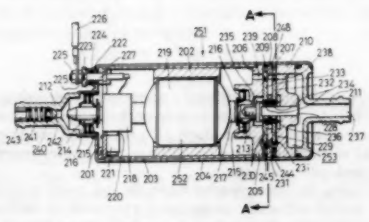
Kenji Hayashi, and Kiyoshi Kato, both of Aichi, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Dec. 22, 1981, Ser. No. 333,315

Claims priority, application Japan, Dec. 27, 1980, 55-185228; Apr. 8, 1981, 56-53641; May 30, 1981, 56-82618

Int. Cl.[3] **F04B** *35/04;* **F04D** *5/00*

U.S. Cl. 417—366 **2 Claims**



1. An electrically powered pump comprising:

a cylindrical housing **204** provided with a field core **202** therein;

a motor **252** mounted in said housing;

a plug-like cover plate **212** attached to one end of said housing and formed with a fuel delivery line **243** passing therethrough;

a pump casing **205** provided at the other end of said housing, said pump casing comprising an end plate **206** on the discharge side, a second sealing spacer **209**, an intermedi-

ate plate **208**, a first sealing spacer **207**, an end plate **210** on the suction side and a cover plate **211** on the suction side formed with a fuel suction line **237** passing therethrough;

a first and a second pump chamber **229** and **230** defined on both sides of said intermediate plate;

a first and a second impeller **232** and **233** rotatably mounted in said first and second pump chambers, respectively, said impellers being individually rotatably supported by a fixed shaft **228** fixed to said end plate;

an armature **219** supported by said bearings and mounted in said housing; and

a connector **235** fixed to the shaft end of said armature on said pump chambers side, said connector being adapted to connect said armature with said impellers in such a manner that the relative motion in a circumferential direction of said connector and said impellers is restricted and that the eccentricity of said armature and said impellers may be absorbed by said connector.

4,445,821

CENTRIFUGAL PUMP HAVING MEANS FOR COUNTERBALANCING UNBALANCED FLUID PRESSURE RADIAL FORCES ON ROTOR

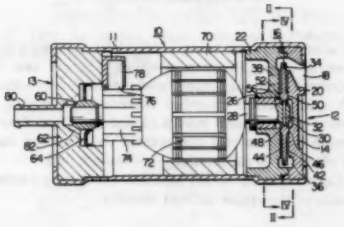
Kiyohiko Watanabe, Chiryu; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Kariya; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 26, 1982, Ser. No. 372,169

Claims priority, application Japan, Apr. 27, 1981, 56-63568

Int. Cl.[3] **F04B** *39/06, 35/04;* **F04D** *5/00*

U.S. Cl. 417—366 **4 Claims**



1. A pump apparatus comprising:

a pump means including a pump housing, a shaft and a rotary pumping member rotatably disposed in said pump housing and mounted on said shaft for rotation therewith, said pump housing being formed with circumferential spaced suction and discharge ports;

driving means drivingly connected to said shaft to rotate said rotary pumping member for pumping a fluid;

bearing means rotatably supporting said shaft adjacent to said rotary pumping member;

said rotary pumping member having an outer peripheral section formed with at least one circumferential row of vane grooves, said pump housing cooperating with said section to define therebetween a fluid passage circumferentially extending between and communicating with said suction and discharge ports with a seal between said housing and section circumferentially between the ends of said passage;

the rotation of said rotary pumping member producing in said fluid passage a circumferentially unbalanced fluid pressure which increases along said fluid passage from said suction port toward said discharge port, the circumferentially unbalanced fluid pressure forming circumferentially unbalanced radially inward forces the resultant force of which is applied through said rotary pumping member to a first side of the peripheral surface of said shaft;

counterbalancing means including a pressure introducing opening formed in said bearing means and having an inner end faced to a second side of the peripheral surface of said shaft substantially diametrically opposite to said first side of said shaft;

said counterbalancing means further including means establishing a fluid-flow communication between said discharge port and said pressure introducing opening whereby the discharge pressure of said pump means is applied to said second side of said shaft to form a counterbalancing force.

4,445,822

INJECTION PUMP

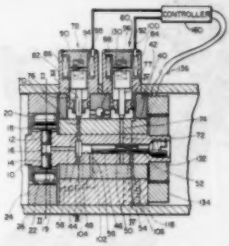
Yoshikazu Hoshi, Tokai, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,359

Claims priority, application Japan, Sep. 22, 1980, 55-130684

Int. Cl.[3] **F04B** *35/02, 19/22;* **F02M** *39/00*

U.S. Cl. 417—388 **4 Claims**



1. An injection pump suited for the delivery of liquid fuel under high pressure to the cylinders of an associated engine comprising:

a housing;

a sleeve mounted on said housing and having first and second stationary passages, each passage communicating with a liquid fuel supply;

a rotor having a central axial bore and a radial bore formed therein, said rotor being inserted in said sleeve and rotated in timed relationship with the engine;

a free piston reciprocally disposed in the central axial bore between first and second pressure chambers, the first chamber including a plurality of first radial passages and a radial spill port and being communicated with the radial bore of said rotor, the second pressure chamber including a plurality of second radial passages and a discharge passage;

a first solenoid value for controlling the amount of liquid fuel sucked into the first pressure chamber through the first stationary passage;

a second solenoid valve for controlling the amount of the liquid fuel sucked into the second pressure chamber through the secondary stationary passage;

a pair of opposing plungers reciprocably disposed in the radial bore of said rotor, and being so constructed as to produce, in accordance with the revolution of said rotor, a compression period in which the liquid fuel is pressurized in the first pressure chamber to move the free piston to pressurize the fuel in the second pressure chamber to supply fuel in the second chamber to the engine through the discharge passage, and a suction period in which the liquid fuel is supplied to the pressure chambers;

a pulser attached to said rotor and adapted to be rotated as a unit with said rotor;

a detector arranged in relation to an outer periphery of said pulser for producing an electric signal in cooperation with said pulser when said rotor is in the timing for commencement of the fuel supply;

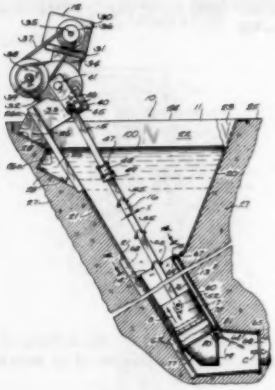
an electronic controller for determining an opening period of said first and second valve during a certain time of said suction period after receipt of said signal, whereby the timing of discharge of liquid fuel and the volume of discharge of the liquid fuel are controlled.

4,445,823

ANIMAL WASTE PUMPING SYSTEM

Ronald L. Zyduck, Mosinee, Wis., assignor to Acorn Equipment Corp., Stevens Point, Wis.

Filed Nov. 18, 1981, Ser. No. 322,490
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—430 **8 Claims**



1. In an animal waste pumping system of the type including (1) a hopper for the collection of waste material, (2) a lower housing attached to the hopper, (3) a pumping chamber within the lower housing, (4) a hollow piston reciprocable within the pumping chamber, and (5) drive means for reciprocating the hollow piston (a) through a pumping stroke during which waste material is pumped out of the hopper into discharge piping connected to receive waste material from the pumping chamber and (b) through a return stroke during which waste material from the hopper enters into and flows through the hollow piston for subsequent pumping, the hollow piston having a first end with pivotable gate means extending thereacross that close during the pumping stroke and open during the return stroke and an open second end, and the drive means including a pair of spaced driving arms connected to the hollow piston through the open second end thereof,

the improvement comprising: a plurality of paddles connected across the spaced driving arms of the drive means and adapted to agitate waste material in the hopper and aid in transfer of waste material into the hollow piston.

4,445,824

VALVE FOR COMPRESSOR CLEARANCE OR BY-PASS CONTROL

Stuart E. Bunn, and Herbert B. Owsley, both of Shawnee Mission, Kans., assignors to Ball Value Co., Inc., Olathe, Kans.

Filed Nov. 2, 1981, Ser. No. 317,157
Int. Cl.³ F04B *23/00*
U.S. Cl. 417—440 **4 Claims**

1. A valve for by-pass control for a gas compressor having a compressor cylinder, a compressor frame with a suction chamber and a valve opening therein, a valve cover over said valve opening and a suction valve assembly with a central passage open to said compressor cylinder and positioned in said valve assembly, whic comprises:

(a) a tubular member which includes:

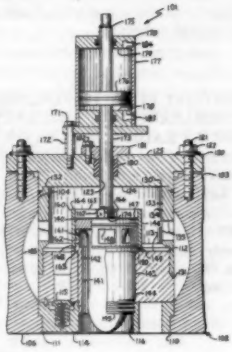
(1) an inner surface defining a bore communicating with said valve assembly central passage;

(2) an outer surface; and

(3) a port through said tubular member and selectively communicating said bore with said suction chamber;

(b) a hollow valve sleeve receiving said tubular member therein and slidable with respect thereto; and

(c) actuator means operably connected to said valve sleeve,



said actuator means being adapted for moving said valve sleeve between an open position whereat said port is uncovered and said compressor cylinder communcates with said suction chamber therethrough and a closed position whereat said port is closed and fluid flow therethrough between said compressor cylinder and said suction chamber is substantially prevented; and

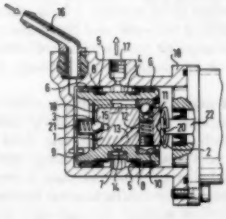
(d) a plug positioned in said bore and occupying a substantial volume of the space defined thereby.

4,445,825

RADIAL PISTON MACHINE

Ludwig Budecker, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,296
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121529
Int. Cl.³ F01B *13/06*; F04B *15/00*
U.S. Cl. 417—462 **20 Claims**



1. A radial piston machine comprising;

a sealed rotor-stator unit received in a housing in an axially

located, radially elastic torsionally secured fashion, said unit having a rotor disposed within a stator and having at least one valued chamber located within said rotor and formed by piston means, said rotor being rotatable in said stator by a connecting shaft through a spring clutch engaging one end face of said rotor;

an elastic means disposed on the periphery of said stator to support said unit in said housing in said axially located, radially elastic and torsionally secured fashion;

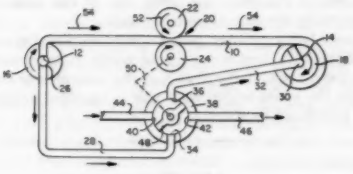
a sealing means disposed on the periphery of said stator adjacent said elastic means to seal said unit to said housing, a ball-and-spring arrangement engaging the other end face of said rotor to axially elastically support said rotor in an axially slidable relationship with said stator wherein

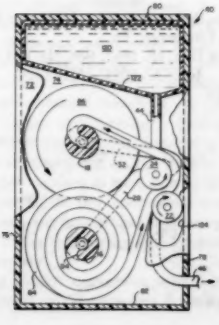
said ball-and-spring arrangement includes a cup-type bushing secured to said stator adjacent said other end face of said rotor,

a compression spring received in said bushing having one end thereof bearing against the bottom of said bushing, and

a bearing ball rotatably supported in the other end of said compression spring and in engagement with said other end face of said rotor.

4,445,826
PERISTALTIC PUMP APPARATUS
Fred P. Tarr, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 22, 1982, Ser. No. 341,912
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—476 **17 Claims**





1. A peristaltic pump comprising:

a pair of pinch rollers to define a nip;

a length of elastic tubing passing through said nip and being collapsed by said pinch rollers sufficiently to block passage fluid at said nip, said tubing having opposite ends;

selectively actuatable means for advancing said tubing in either one of two opposite directions through said nip;

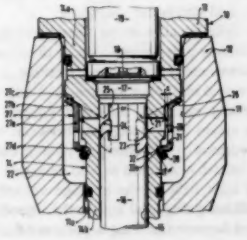
means for defining a pump intake;

means for defining a pump discharge; and

means for coupling one end of said tubing with said pump intake and the other end of said tubing with said pump discharge while said tubing is advanced through said nip in one direction and for coupling said one end with said pump discharge and said other end with said pump intake while said tubing is advanced through said nip in the other direction.

4,445,827
Patent Not Issued For This Number

4,445,828
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES
Karl Sontheimer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 14, 1982, Ser. No. 397,969
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136751
Int. Cl.³ F02M *59/44*
U.S. Cl. 417—490 **5 Claims**



1. A fuel injection pump for internal combustion engines having a cylinder bushing arranged to receive a pump piston, a pump piston in said bushing, said bushing further having at least one return flow opening for returning fuel flow controlled by said pump piston, and an impact protection ring positioned on said bushing, said impact protection ring being pressed by a holder means against an abutment shoulder located above said return flow opening in the pumping direction, said ring further having a cylindrical wall portion and an inner wall provided with means defining openings therethrough

which enclose an annular chamber, said wall portion further having flowthrough openings in said inner wall arranged to connect said return flow opening with a return flow chamber, characterized in that said impact protection ring further includes adjacent to said cylindrical wall portion an at least approximately radially outwardly bent, circular-annular collar, which rests on said abutment shoulder and said collar has an end face enlarged in area by a multiple of the cross sectional area of said cylindrical wall portion.

4,445,829

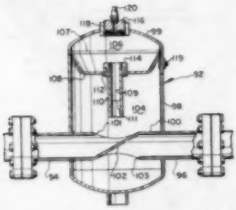
APPARATUS FOR DAMPENING PUMP PRESSURE PULSATIONS

James D. Miller, 9218 Alta Oaks Dr., Dallas, Tex. 75243

Continuation-in-part of Ser. No. 216,161, Dec. 15, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,959

Int. Cl.³ F04B *11/00*

U.S. Cl. 417—543 **4 Claims**



1. In a hydraulic system including a positive displacement reciprocating plunger pump connected to a discharge flow line disposed to produce a static head at the pump due to a vertical change in elevation of said flow line, said head comprising a major portion of the liquid discharge back pressure imposed on said pump, the improvement comprising, a pressure pulsation dampener for reducing peak-to-peak hydraulic pressure pulsations in said flow line at least approximately 75% of peak-to-peak pressure pulsations observed without said dampener in said system resulting from flow variation of fluid discharged from said pump and from acceleration of said fluid through said flow line, said dampener including:

a generally cylindrical pressure vessel forming an enlarged volume chamber and interposed in the flow line immediately downstream of the pump discharge conduit, said pressure vessel including aligned inlet and discharge conduits opening into said enlarged volume chamber and including means interposed therebetween which together with the volume of said enlarged volume chamber reduces the flow velocity of liquid in said enlarged volume chamber by at least 85% of the average velocity in said flow line, a bulkhead disposed across the interior of said pressure vessel between at least a portion of a liquid volume chamber in said pressure vessel and a gas volume chamber in said pressure vessel, said gas volume chamber being defined in part by said pressure vessel, said liquid volume chamber having a volumetric capacity in the range of 5% to 10% of the liquid flow rate through said dampener wherein the units of volume of said liquid volume chamber and the flow rate are the same and the unit of time of the flow rate is one minute, and a tube elongated with respect to the thickness of said bulkhead extending through said bulkhead and being open to chamber portions formed in said enlarged volume chamber on both sides of said bulkhead, and said dampener is charged with pressure gas such that at the nominal working pressure of said system said gas volume chamber is maintained at 5% to 20% of said liquid volume chamber.

4,445,830

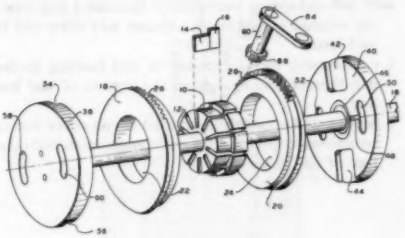
RADIAL VANE PUMP HAVING VARIABLE DISPLACEMENT

Frank Woodruff, New Hartford, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 17, 1982, Ser. No. 409,007

Int. Cl.³ F04C *2/00, 15/04*

U.S. Cl. 418—22 **21 Claims**



1. A variable displacement vane pump comprising:

a ported casing having a pair of relatively rotatable complementary cams, each having an annular shape and a surface shaped to provide an annular curvilinear track;

a rotor rotatably mounted in said casing, said annular shaped cams encircling said rotor;

a first and second plurality of vanes slidably mounted upon said rotor, each of said vanes being sized and positioned to engage a corresponding one of said pair of cams, said vanes being constrained in a radial direction by said cams as said rotor rotates, the vanes of the first plurality engaging one of the cams, the other one of the cams being engaged by the second plurality; and

said vanes being grouped into a combined plurality of circumferentially spaced pairs, each of the pairs comprising one from each of the first and the second plurality of vanes, the vanes within each pair being sized differently and positioned adjacently.

4,445,831

SCREW ROTOR MACHINE ROTORS AND METHOD OF MAKING

Robert A. Ingalls, Springfield, Vt., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 15, 1982, Ser. No. 451,568

Int. Cl.³ F01C *1/16, 1/24*

U.S. Cl. 418—201 **9 Claims**

1. An improved screw compressor for the compression and axial displacement of gas, said compressor of the type having a

housing formed with an axially extending passage having at one axial end a gas inlet and at the other axial end a gas outlet, a one piece male rotor extending axially in said passage and formed with a plurality of helical ribs having generally convex flanks and root regions formed at least partially as involutes in cross section, wherein said improvement comprises:

each rib of said male rotor having a profile consisting of a leading flank formed at least partially as an involute generated from a first base circle and a trailing flank at least partially formed as an involute generated from a second base circle said second base circle having a diameter greater than said first base circle.

4,445,832

Patent Not Issued For This Number

4,445,833

SPINNERET FOR PRODUCTION OF COMPOSITE FILAMENTS

Yoshikazu Moriki, and Masafumi Ogasawara, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,697
Claims priority, application Japan, Feb. 18, 1981, 56-21505
Int. Cl.³ D01D *3/00*
U.S. Cl. 425—131.5 **32 Claims**

1. In a spinneret for use in producing composite filaments, each filament consisting of at least first and second constituents extending axially, the spinneret having an axis and extruding composite melt streams, which are to become corresponding composite filaments, each respective composite melt stream comprising a predetermined number of first streams of the first constituent melt, and the same number of second streams of the second constituent melt, which second streams are embedded in the respective first streams, the spinneret having first passages formed therein, through which the first constituent melt is forced to pass to form the respective first streams, and having second passages formed therein, through which the second constituent melt is forced to pass to form the respective second streams, said first and second passages becoming partially combined to produce the respective primary composite streams, each primary composite stream having a first stream with a second stream embedded therein, as defined above, and then to produce respective secondary composite streams, referred to as "composite melt streams", the improvement being in that

(A) each of said first passages is comprised of:

(i) a common combining chamber for the first constituent melt, having upper and lower inner flat surfaces;

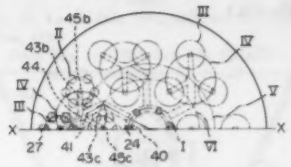
(ii) an upstream passage portion having substantially the same length as that of any other first passage from the first constituent melt provided outside of the spinneret to said combining chamber and forming a feeding hole at the same one of the surfaces of said combining chamber; and

(iii) a uniting chamber having an axis parallel to the axis of the spinneret and forming at least an inlet hole at its upper end for introducing the first and second constituent melts at the lower inner surface of said combining chamber and an extruding outlet at its lower end for extruding a composite melt stream;

(B) said extruding outlets contain at least a pair of outlets which are different radial distances from the axis of the spinneret;

(C) said extruding outlets are grouped so that each group consists of at least one extruding outlet and is paired with a respective one of said feeding holes; and

(D) the axis of each extruding outlet in each group is spaced radially apart from the paired feeding hole at substantially the same distance as that of any other extruding outlet in the same group and as that in any other group,



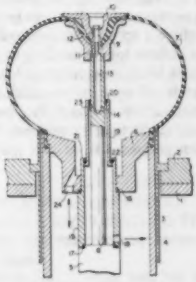
whereby said first passages, in combination with the second passages, allow each of the first constituent melts to travel substantially the same distance thereby to form, in combination with the second constituent melts, respective secondary composite streams while exerting substantially the same resistance against the flowing of the streams of each of the first constituent melts.

4,445,834

DRAIN DISCHARGE DEVICE IN A TIRE CURING MACHINE

Katsuyoshi Sakaguchi, and Akira Hasegawa, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,293
Int. Cl.³ B29D *29/00*; B29H *5/00*
U.S. Cl. 425—36 **1 Claim**



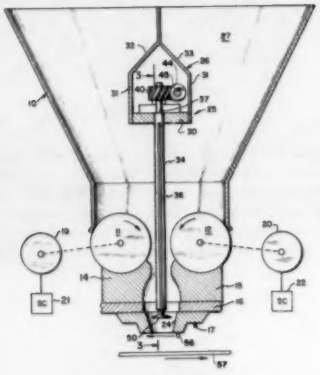
1. A drain discharge device in a tire curing machine, characterized in that a drain discharge blind bore communicating with drain discharge paths provided in an upper ring and a bladder fastener, respectively, both mounted at the top of a rod of a center cylinder and clamping the top end of a bladder therebetween and having a drain port at its lower end, is provided within the rod of said center cylinder, that said center cylinder is also provided with a spacer formed integrally with said center cylinder and having a drain discharge port at its lower end, and that between said spacer and said rod is provided a movable sleeve covering said drain port which sleeve is slidable relative to the respective ones of said spacer and said rod and has its sliding surfaces sealed.

4,445,835

METHOD AND APPARATUS FOR MARBLEIZING AN EXTRUDED DOUGH

Max L. Wasserbach, Summit, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 25, 1982, Ser. No. 411,408
Int. Cl.³ B29B 5/04
U.S. Cl. 425—131.1 **8 Claims**



1. Apparatus for producing spirally marbleized cookie dough pieces comprising a hopper having an outlet, a plurality of extrusion dies fed from said outlet, a pair of dough feeding rollers spaced from each other and interposed between said dies and said outlet to receive dough flow from said outlet and deliver the dough flow to said dies, a partition dividing said hopper and extending between said rollers to a point adjacent the inlets of said dies, said partition being spaced from each of said rollers whereby different doughs on opposite sides of said partition are independently fed by said rollers along said partition into said dies, an impeller within each die below said partition for larding portions of each dough into the flow of the other dough to produce a spirally marbleized extrudate, said partition including a hollow tube extending to the inlet of each die and plate members interconnecting said tubes, a shaft extending through each of said tubes, said impellers being mounted on said shafts, drive means at the upper ends of said shafts for rotating said shafts to drive said impellers, and means for slicing cookie dough pieces from said spirally marbleized extrudates.

4,445,836

INTEGRATED PROCESS FOR PREPARING A CONTINUOUS STRING OF MOLDED ARTICLES WOUND IN A COIL

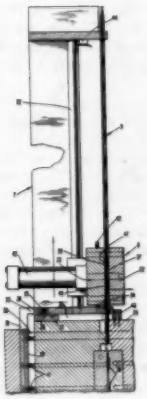
C. Bruce Dawson, Winchester, Va., assignor to O'Sullivan Corporation, Winchester, Va.

Filed Oct. 28, 1981, Ser. No. 316,033
Int. Cl.³ B29D 5/00; B29F 1/14
U.S. Cl. 425—135 **1 Claim**

1. An apparatus for forming and coiling a continuous string of molded items, the apparatus comprising a mold for molding an item such that the item has an integral trailing connector,

advancing means for advancing the string to generally remove such item from the mold cavity while a portion of the trailing connector thereof remains in the cavity so that a subsequently molded item is connected to the trailing connector of a preceding item and is spaced from the preceding item and wherein the advancing means comprises a cam, means for inserting the cam into the space between two successive items, and means for moving the cam in the direction of advancement so that the cam pushes against one of the items and advances the string,

the advancing means comprising two movable jaws which are movable together in the vertical direction and to one of which the cam is attached, and with at least one jaw being movable relative to the other jaw in the horizontal direction to thereby confine items therebetween upon inserting the cam in the space between two successive items,



tensioning means for imposing a constant tension on the string,

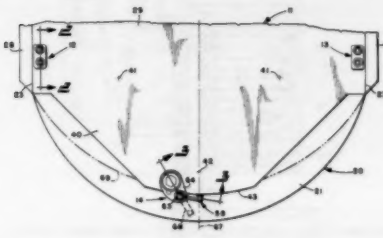
the tensioning means including at least one movable guide for the string, a first and second sensing means between which the guide moves, with the first sensing means activating a winder and the second sensing means deactivating the winder, and a bar with a guide at each end, said bar being rotatable about an axis disposed perpendicular to the bar and being resiliently biased so that the guide first contacted by the string is urged generally toward the direction of advancement of the string and the guide subsequently contacted by the string is urged generally away from the direction of advancement, and

coiling means for periodically winding the string into coil form while a constant tension is imposed thereon.

4,445,837
FOAM EXTRUSION DIE AND MONITORING APPARATUS

James R. Cisar, Cuyahoga Falls, and Attila Grauzer, Akron, both of Ohio, assignors to U.C. Industries, Tallmadge, Ohio

Filed Sep. 24, 1982, Ser. No. 422,678
Int. Cl.[3] B29D *27/00*; B29F *3/04*; G01B *5/14*
U.S. Cl. 425—141 38 Claims

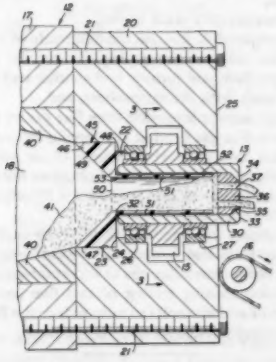


1. An extrusion die and monitoring apparatus comprising a pair of opposed die lips at least one of which is adjustable to vary the size and shape of a die orifice defined between said die lips, and plural sensor means located along the die lips for directly sensing the position of a die lip at respective locations to effect monitoring of the die orifice size and shape.

4,445,838
APPARATUS FOR EXTRUDING A COMESTIBLE

Edwin T. Groff, 120 S. 3rd Ave., West Reading, Pa. 19611

Filed Dec. 27, 1982, Ser. No. 453,145
Int. Cl.[3] B29F *3/04*
U.S. Cl. 425—319 10 Claims

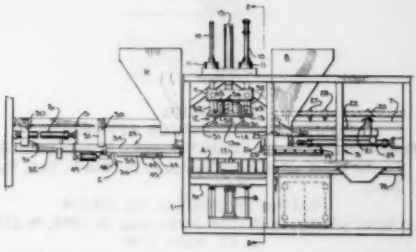


1. Apparatus for extruding a comestible, comprising a chamber for connection to a source of comestible under pressure, an outlet part on said chamber having an outlet opening, journal bearing means in said outlet opening, a hollow extrusion die journaled in said bearing means and having a discharge opening for discharging comestible extrudate while rotating the same, and a seal construction in said outlet opening and sealing the same against access by the comestible to the bearing means, said seal construction comprising an entry enlargement having a through opening and secured fast in said outlet opening upstream of said die to preclude the passage of comestible between said enlargement and the adjacent region of said outlet part, and a reduced tubular extension extending downstream from the through opening of said entry enlargement closely into said hollow die toward said discharge opening for sliding engagement with said die, said sliding engagement defining an effective rotary seal against access of comestible to said bearing means.

4,445,839
RECIPROCATING TAMPER FOR A CONCRETE MOLD PRESS

Julius Crane, Ft. Lauderdale, Fla., assignor to Metalfab, Inc., Beaver Dam, Wis.

Filed Sep. 16, 1982, Ser. No. 419,079
Int. Cl.[3] B28B *21/12*, *21/14*
U.S. Cl. 425—421 16 Claims



1. A concrete mold press for a concrete molding machine, comprising:

a main frame;

a carriage slidably mounted for vertical movement on said frame above a mold for containing cement-mix;

a cement mix engaging compacting plate member carried by said carriage and having a press plate member receivable in said mold for engaging the surface of said cement-mix in the mold, said press plate member being moveable between an operating position in pressing contact with the cement mix surface and a position spaced from said cement mix surface, means for moving said carriage toward and away from said mold to move said engaging member between said positions and to compress the cement mix in the mold;

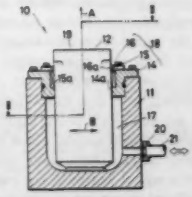
vibration-producing means operatively associated with said compacting and press plate members;

tamping means responsive to the vibrations of said compacting and press plates and disposed so as to strike said compacting plate member and impart an intermittant tamping action to said member in addition to said vibrations and to the compressing action of said member when said member is in contact with the cement mix.

4,445,840
PRESSURE CYLINDER APPARATUS AND HYDRAULIC PRESS INCORPORATING THE SAME

Takeji Kenmochi, Shizuoka, Japan, assignor to Kohtaki & Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1983, Ser. No. 456,207
Claims priority, application Japan, Jun. 11, 1982, 57-99186
Int. Cl.[3] B30B *1/32*, *11/02*
U.S. Cl. 425—450.1 11 Claims



1. A pressure cylinder apparatus comprising a cylinder and

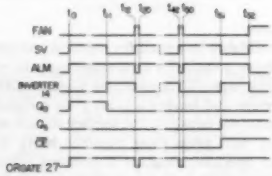
a slidable member adapted to be moved back and forth in the axial direction in said cylinder in response to a charging and discharging of a fluid into and out of said cylinder, wherein that the said slidable member has a polygonal cross-sectional shape and that a stopper assembly having an aperture slidable receiving said slidable member and having a polygonal shape substantially conforming with the cross-sectional shape of said slidable member is provided in the plane perpendicular to the direction of movement of said slidable member.

4,445,841

COMBUSTION CONTROL APPARATUS

Toshio Tanaka, Toride; Sumio Nakagawa, Matsudo, and Kenzi Toudo, Yanai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,714
Claims priority, application Japan, Aug. 24, 1981, 56-131518
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—27 **7 Claims**



7. A combustion control apparatus, comprising:

a combustion control integrated circuit element including a first input terminal supplied with a flame detection signal representative of presence or absence of flame, a second input terminal supplied with a clock pulse signal, timer means for counting the clock pulses applied to said second input terminal to thereby clock a first time interval and a second time interval, and control means having inputs supplied with the signals from said first input terminal, said second input terminal and said timer means for energizing a blower during said first time interval for igniting operation, energizing said blower, an ignitor and a fuel valve for said second time interval following said first time interval, and producing continuously an output signal for energizing said fuel valve in response to said flame detection signal applied to said first input terminal, said combustion control integrated circuit further including a first output terminal, a second output terminal and a third output terminal for energizing said blower, said ignitor and said fuel valve, respectively;

a frequency divider circuit for dividing the first clock pulse signal to thereby produce a second clock pulse signal; and

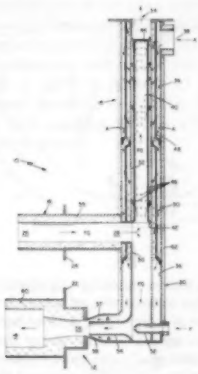
a clock pulse signal change-over circuit having inputs supplied with the signal from said second output terminal or alternatively from said third output terminal, said first clock pulse signal and said second clock pulse signal to thereby produce said first clock pulse signal or alternatively said second clock pulse signal at said third input terminal, wherein said second clock pulse signal output is changed over to said first clock pulse signal output in response to a signal representing expiration of said first time interval and appearing at said second output terminal or alternatively at said third output terminal.

4,445,842

RECUPERATIVE BURNER WITH EXHAUST GAS RECIRCULATION MEANS

Andrew J. Syska, Marblehead, Mass., assignor to Thermal Systems Engineering, Inc., Woburn, Mass.

Filed Nov. 5, 1981, Ser. No. 318,372
Int. Cl.³ F23L *15/04*
U.S. Cl. 431—115 **8 Claims**



1. A recuperative burner for a furnace comprising

a housing having a combustion chamber in it,

said combustion chamber having an outlet for communication with said furnace and an inlet for receiving air, recirculated flue gas, and fuel,

a recuperative stack to preheat air supplied to said combustion chamber inlet to reduce fuel requirements of said burner,

said recuperative stack having

a recuperative flue gas conduit made of a heat conductive material and having one end for receiving flue gas from said furnace and another end for communication with the atmosphere, and

an air passage separated from flue gas by said recuperative flue gas conduit and having an inlet for connection to a pressurized source of air and an outlet in communication with said chamber inlet,

a fuel inlet nozzle in said housing for directing fuel to said chamber inlet, and

a recirculating flue gas conduit with one end for receiving flue gas from said furnace and another end connected to direct recirculated flue gas to said combustion chamber at a location causing mixing of said flue gas and fuel upstream of said air outlet so as to reduce the flame temperature, thereby reducing the NO_x content.

4,445,843

LOW NO_x BURNERS

Peter B. Nutcher, Venetia, Pa., assignor to Process Combustion Corporation, Pittsburgh, Pa.

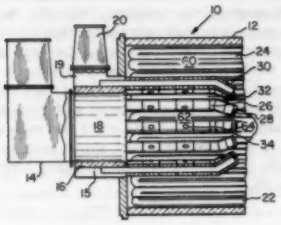
Filed May 17, 1982, Ser. No. 379,086
Int. Cl.³ F23L *9/00*
U.S. Cl. 431—115 **4 Claims**

1. In a combustion system such as a fired heater or oilfield streamer including a heater radiant section and a burner capable of operating in a reducing mode for directing partially combusted products of combustion into one end of said section, the improvement comprising a combustion add-on unit for staged combustion having:

A. a precombustion chamber defined by a chamber wall and mounted between the burner and the heater radiant section;

B. a combustion air plenum surrounding said precombustion chamber and including a combustion sustaining gas inlet;

C. a plurality of spaced tubes defining a perforated combustion chamber extending from the air plenum axially into said section and terminating in line with said partially combusted products of combustion and in spaced relation-



ship to said precombustion chamber, said tubes terminating in a converging section and mounted to an exterior of said wall; and

D. sections of protective refractory members positioned along each tube in abutting end to end relationship to protect said tubes within said section.

4,445,844

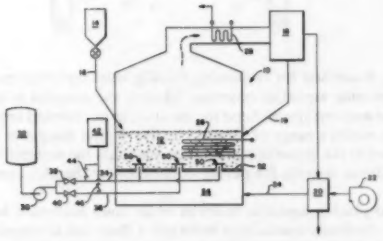
LIQUID FUEL AND AIR FEED APPARATUS FOR FLUIDIZED BED BOILER

Francis T. Matthews, Poquonock, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 20, 1982, Ser. No. 451,114

Int. Cl.³ F23D *19/02*

U.S. Cl. 431—170 **5 Claims**



1. In combination, a fluidized bed furnace in which fluid fuel is burned including chamber means, a base plate forming the bottom of the chamber means, solid particles positioned above the base plate which forms the material making up the fluidized bed, a plurality of injector means extending up through the base plate, each injector means including a central vertical pipe means closed as its top, means for supplying fuel to the vertical pipe means, mean forming an open annular space surrounding the vertical pipe means, means for supplying air up into the annular space from beneath the base plate, said base plate being imperforate except for said means for supplying air to said annular spaces, means forming a plurality of radial passage means extending outwardly from the annular space, each radial passage means having a restricted flow portion near its outer end, and opening means in the vertical pipe means in alignment with said radial passage means for directing fuel into each of the radial passage means.

4,445,845

FLAMBEAU

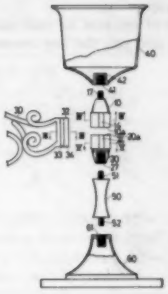
Jiro Serizawa, Tokyo, Japan, assignor to Selon Co., Ltd., Japan

Filed Sep. 4, 1981, Ser. No. 299,285

Claims priority, application Japan, May 26, 1981, 56-75219[U]

Int. Cl.³ F21V *35/00*

U.S. Cl. 431—295 **6 Claims**



1. A flambeau comprising:

(a) a pair of upper and lower elongated connecting members having a pair of axial cavities formed in their respective portions disposed adjacent to each other, said cavities opening to the one ends of said connecting members, respectively, and being disposed in alignment with each other, each of said connecting members having a plurality of axial slots formed in said adjacent portion thereof and extending radially outwardly from said cavity and opening to the side thereof, said plurality of slots in said upper connecting member being disposed in alignment with said plurality of slots in said lower connecting member, said upper connecting member haivng a threaded portion at the other end thereof, and said lower connecting member having a threaded portion at the other end thereof;

(b) a plurality of support arms detachably connected at their inner ends to said upper and lower connecting members and extending radially therefrom, each support arm having a candle support portion at its outer end and a vertically extending connecting portion at its inner end, said connecting portion having a first section and a second section extending inwardly therefrom, said second section being greater in width than said first section, said first section being snugly received in said aligned slots of said upper and lower connecting members, said second section being snugly received in said aligned cavities of said connecting members, and said upper and lower connecting members being mated together at said one ends so that said connecting portions are completely covered by said connecting members;

(c) a base having at its upper end a threaded portion threadedly engaged with said threaded portion of said lower connecting member to detachably connect them together; and

(d) a central decorative member having at its lower end a threaded portion threadedly engaged with said threaded portion of said upper connecting member.

4,445,846

FLAME HOLDING LIGHTER FOR INDUSTRIAL GAS-FIRED OVENS

Owen M. Mattingly, 2241 Monocacy Rd., Baltimore, Md. 21221

Filed Jan. 28, 1982, Ser. No. 343,488

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—352 **3 Claims**

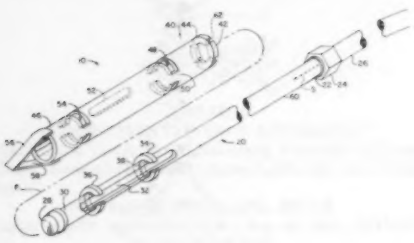
1. In a torch for igniting industrial furnaces and the like and

having means for receiving gas, means for receiving air, baffle means, and flame outlet means,

the means for receiving gas including an inner pipe with a first end thereof proportioned for receiving gas as from a flexible hose and a second end thereof closed;

the means for receiving air comprising an outer pipe around the inner pipe with a space therebetween, said outer pipe having a free end and a butt end, and said flame outlet means comprising means for expulsion of burning gas-air mixture from said space including at least one opening at said free end of the outer pipe;

means for induction of ambient air into said space for mixing with and burning said gas, the improvement including:



the inner pipe having a gas-expulsion slot on a first side thereof opening within said space,

said outer pipe butt-end and the exterior of said inner pipe defining an air intake opening therebetween, said outer pipe further including an air intake slot at a position opposite said gas expulsion slot in the inner pipe; the baffle means being spaced apart longitudinally in said space, the baffle means being "C"-shaped with the open part of the "C"-shape coincident with the gas expulsion slot in the inner pipe, the outer pipe having first and second vent openings circumferentially therearound in longitudinal spacing from each other, said first and second vent openings being respectively beyond the ends of said air intake slot in the outer pipe, and a flame spreader on the free end of said outer pipe.

4,445,847

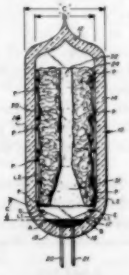
PHOTOFLASH LAMP

John A. Scholz, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 26, 1982, Ser. No. 382,323

Int. Cl.³ F21K *5/02*

U.S. Cl. 431—362 **8 Claims**



1. An electrically-activated photoflash lamp comprising:

a hermetically sealed, light-transmitting substantially cylindrical envelope having a base portion with an inner, substantially concave surface, and opposed upstanding sidewalls extending therefrom;

a pair of spaced leads positioned within said base portion and having end portions each having access to the interior of said envelope;

a quantity of primer material positioned on said concave surface of said base portion in contact with said end portions of said leads; and

a combustible metal shred mass precompressed externally of said envelope to a diameter less than the inner diameter of the envelope and thereafter inserted within said envelope, said shred mass having resiliency whereby the precompressed mass only partially expands within the envelope to provide minimum contact support of the shred mass in the envelope while at the same time providing a relatively unobstructed clearance about the shred mass between the shred mass and internal surfaces of said upstanding sidewalls of said envelope for ignition of said mass along said sidewalls of the envelope, said shred mass including a substantially central void section extending longitudinally therethrough.

4,445,848

ASPHALT RECLAMATION SYSTEM AND UNIT

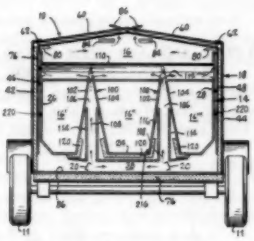
Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corporation, Amityville, N.Y.

Continuation-in-part of Ser. No. 268,661, Jun. 1, 1981, Pat. No. 4,418,682. This application Sep. 10, 1982, Ser. No. 416,629

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.³ F27B *14/00*; **F23D** *13/24*

U.S. Cl. 432—13 **10 Claims**



1. A method for reclaiming initially solid asphaltic material to provide asphaltic concrete, wherein the material is heated from ambient atmospheric temperature to an elevated temperature within a range of about 275°–300° F. and thereafter maintained at the elevated temperature such that the material is in a condition suitable for paving application or the like, comprising:

(a) placing asphaltic material in an inner enclosure having thermally conductive walls and a floor and arranged such as to enable delivery of the initially solid asphaltic material downwardly from the top of the inner enclosure toward the floor of the inner enclosure;

(b) intermittently producing a heated gas in accordance with a predetermined schedule;

(c) heating the asphaltic material from ambient atmospheric temperature by passing a first portion of the heated gas within a gas volume defined by the inner enclosure of an outer enclosure, such that the heated gas passing the walls and floor heats the portions of the asphaltic material in the inner enclosure adjacent the walls and floor until the material reaches a temperature within a range of about 275°–300° F.;

(d) further heating the asphaltic material by passing a second portion of the heated gas through at least one heating chamber communicating with and projecting upwardly from the gas volume into the inner enclosure, such that the heated gas passing through the heating chamber heats the interior portions of the asphaltic material in the inner

enclosure adjacent the heating chamber from both the longitudinal and transverse directions until the material reaches a temperature within a range of about 275°–300° F.;

(e) passing all the heated gas through a plurality of small apertures spaced about the upper portions of the walls of the inner enclosure, such that the heated gas flows from the gas volume uniformly across the upper surface of the asphaltic material in the inner enclosure and the portions of the asphaltic material near the upper surface are heated until the material reaches a temperature within a range of about 275°–300° F.;

(f) venting the heated gas to the outside atmosphere after it has flowed across the upper surface of the asphaltic material; and

(g) sensing the temperature of the asphaltic material within the inner enclosure and maintaining the asphaltic material through intermittent heating thereof at a uniform temperature within a range of about 275°–300° F. for a long period of time.

4,445,849

DEVICE FOR THERMAL TREATMENT OF SCRAP

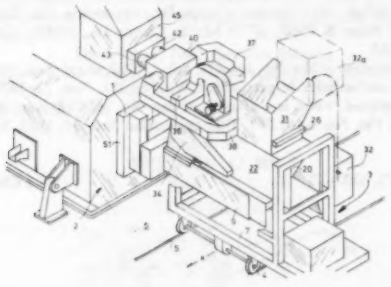
Bernard Bouillé, St. Florentin, France, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 18, 1982, Ser. No. 379,456

Claims priority, application Switzerland, May 25, 1981, 3401/81

Int. Cl.³ F27B *9/02, 3/04*

U.S. Cl. 432—128 **9 Claims**



1. An apparatus for pre-heating and feeding metal scrap to a furnace chamber comprising a heating chamber having a top wall, a bottom wall and a sidewall defining said chamber, a scrap metal inlet provided in said top wall at a location remote from said furnace chamber and a scrap metal outlet provided in said bottom wall at a location proximate to said furnace chamber, means provided in said heating chamber for moving said metal scrap from said scrap metal inlet to said scrap metal outlet, loading means positioned below said heating chamber adjacent to said scrap metal outlet for receiving said scrap metal from said scrap metal outlet, said loading facility including means for feeding said metal scrap to said furnace chamber and means associated with said furnace chamber and said heating chamber for communicating the heated waste gas from said furnace chamber to said heating chamber for pre-heating said metal scrap.

4,445,850

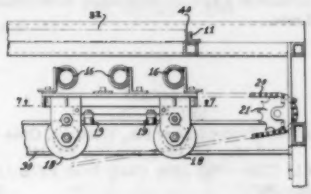
MACHINE FOR HEATING ELONGATED FLAT SURFACES

Axel E. Hansen, Jr., 5045 Lawnview St., Jacksonville, Fla. 32205, and James C. Richardson, 5212 Damascus Rd., Jacksonville, Fla. 32207

Filed Sep. 29, 1982, Ser. No. 427,788

Int. Cl.³ F24J *3/00*

U.S. Cl. 432—229 **14 Claims**



1. A machine for heating elongated flat surfaces comprising an elongated supporting framework having on its upper portion peripheral ledges for supporting the edges of an elongated flat plate to be heated, parallel tracks beneath said peripheral ledges running lengthwise of said framework, a wheeled carriage adapted to move in said tracks from one end of said framework to the other, heating means carried on said carriage to direct heat against the underneath surface of said plate, and driving means to move said carriage at a steady pace along said tracks.

4,445,851

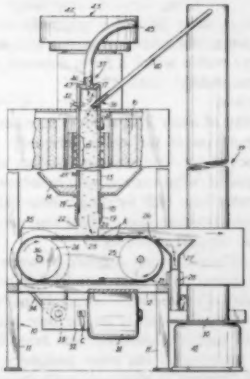
APPARATUS AND METHOD FOR FIRING CERAMIC ARTICLES OR THE LIKE

Dehart G. Scrantom, Shallotte, N.C., and Truman C. Rutt, Myrtle Beach, S.C., assignors to AVX Corporation, Great Neck, N.Y.

Filed May 8, 1981, Ser. No. 262,033

Int. Cl.³ F27D *3/00*; **F27B** *15/00*

U.S. Cl. 432—239 **8 Claims**



1. Apparatus for the firing of ceramic articles, such as capacitors or the like, suspended in a particulate mass of heat resistant material such as sand comprising an elongate, vertically arrayed tubular furnace member of refractory material having an upper entrance end and a horizontally arrayed lower exit end, heating means surrounding said furnace for heating at least a section of said furnace member, horizontally arrayed discharge conveyor means having an upper surface disposed beneath and in proximate spaced blocking (relating onto) relation to said exit end, said conveyor means being spaced from

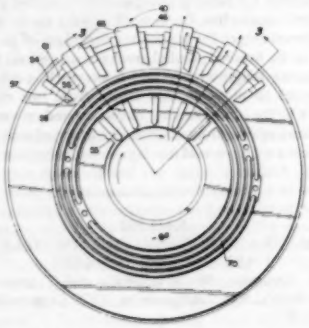
said exit end a distance adapted to be at least slightly greater than the smallest dimension of said articles, said conveyor means comprising a perforate belt member sized to permit said particulate material to pass therethrough but to retain said articles, infeed means at said entrance end for progressively introducing increments of said particulate mass and said articles at a controlled rate, and means for progressively advancing said conveyor means in a horizontal direction across said exit end, at a rate to continuously remove increments of said mass and articles at a rate corresponding substantially to said controlled rate.

4,445,852

DIFFUSERS

Reg D. Corbett, 30103 Clemens Rd., Westlake, Ohio 44145

Filed May 10, 1982, Ser. No. 376,265
Int. Cl.³ C21D *9/00, 1/06;* F24H *3/06;* F27B *11/00*
U.S. Cl. 432—260 **10 Claims**



1. A diffuser assembly for transmitting thermal energy by conduction across metallic members and convection of a heat-treating gas in an annealing furnace comprising:

(a) a diffuser member having a generally annular shape defined by inner and outer peripheries; and provided with a central eye within which a fan is disposed, said diffuser member comprising:

(i) a base plate;

(ii) a plurality of outer load support members secured to spaced portions of the outer periphery of said base plate, each outer load support member comprising a pair of spaced radial vertical wall members and a transverse vertical rear wall forming substantially U-shaped gas passages between said vertical wall members of said outer load support members;

(iii) a flow deflecting ramp disposed between each pair of adjacent spaced outer load support members;

(iv) a plurality of spaced vertical radial inner load support members spaced inwardly on the base place from the outer load support members, each inner load support member initiating at the inner periphery of the base plate and disposed in alignment with the center axis of one of said U-shaped gas flow passages;

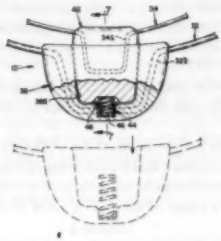
(v) a tubular ring-like cooling member disposed in an annular space provided in the diffuser between said outer and inner support members and transverse to the path of gas flow, the gas being circulated by the fan out of the eye of the diffuser and diverted by the inner load support members to cause flow of said gas on either side of the said inner load support members and about the cooling member into the U-shaped gas passages and over said ramps.

4,445,853

POSITIVE RELEASE FACE-BOW/MOUTH-BOW MECHANISM

Paul E. Klein, 928 Lake Shore Rd., Lake Oswego, Oreg. 97034

Filed May 25, 1983, Ser. No. 497,755
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—5 **18 Claims**



1. A safety release mechanism in the orthodontic combination of a curved mouth-bow device and a curved face-bow device which are separable from one another, where, during use, the face-bow device is designed to impart compressive force to the mouth-bow device, said mechanism comprising

a pair of compression-transmission couplings one for each of such two devices, operatively interactable with one another to transmit a compressive force between the two devices, and

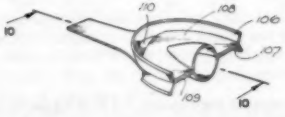
spring parting means operatively associated with said two couplings, functioning, with the couplings interacting to transmit such a compressive force between the devices, to urge the devices freely apart from one another.

4,445,854

APPARATUS FOR CONSTRUCTING REGISTERED TEETH CASTINGS

Ivan Bekey, 4624 Quarter Charge Dr., Annandale, Va. 22003, and Roger S. Wolk, 23716 Malibu Colony Dr., Malibu, Calif. 90265

Continuation of Ser. No. 166,435, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 960,381, Nov. 13, 1978, abandoned, which is a division of Ser. No. 745,712, Nov. 29, 1976, Pat. No. 4,161,067. This application Nov. 19, 1981, Ser. No. 362,426
Int. Cl.³ A61C *9/00*
U.S. Cl. 433—37 **1 Claim**



1. A dental tray for holding impression material, said dental tray being adapted to simultaneously obtain registered upper and lower dental impressions, comprising:

a first U-shaped peripheral retaining wall;

first dividing means, said first dividing means being attached to one of the U-shaped edges of said first wall, said first dividing means and first wall combination comprising an upper tray section;

a second U-shaped peripheral retaining wall;

second dividing means, said second dividing means being attached to one of the U-shaped edges of said second wall, said second dividing means and second wall combination comprising a lower tray section, said upper and lower tray sections being operatively movably placed back-to-back

so that said first and second dividing means are in contact with each other,

said first and second dividing means being non-porous and deformable when bitten to conform to the contours of the biting surfaces without tearing or perforating while at the same time maintaining the deformed relationship after the biting surfaces are removed, said respective dividing means being thin enough to allow all upper and lower teeth to come to full occlusion, the attachment of said dividing means to the respective U-shaped walls combined with the rigidity of the respective dividing means being sufficient to enable said dividing means to support impression material contained in the dental tray;

means adapted to maintain said upper tray section in position with respect to said lower tray section once they have been positionally adjusted with respect to each other;

a handle secured to the anterior portion of the U-shaped wall of at least the one tray section adapted to receive overbiting or underbiting teeth, whereby impressions of teeth having overbite or underbite characteristics are obtained without said handle interfering with proper registration; and

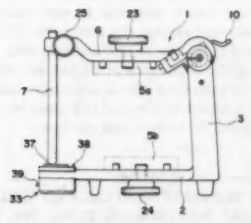
a cavity formed in at least one tray section adjacent the anterior portion of the U-shaped peripheral retaining wall, said cavity extending below the plane of the dividing means of at least one tray section to accommodate a gross overbite or underbite condition.

4,445,855

ARTICULATION DETECTOR CRT FOR ARTICULATORS

Sumiya Hobo, Tokyo, and Koji Okamoto, Suita, both of Japan, assignors to Shioda Dental Manufacturing Co., Ltd., Tochigi, Japan

Filed Sep. 7, 1982, Ser. No. 415,460
Claims priority, application Japan, Sep. 9, 1981, 56-143070
Int. Cl.³ A61C 11/00
U.S. Cl. 433—59 2 Claims



1. An articulation detector for adjustments of an arcon type semi-adjustable articulator, comprising a body having the same shape as an incisal guide of the articulator and having means for mounting on an anterior part of a lower jaw member of the articulator, a power source housed in the body, a luminous element so arranged in the body that the light emitted therefrom can be observed from the outside, and a pair of electrodes connected in series with said power source and said luminous element, one of said electrodes being mounted on the top of the body on which an incisal pin removably mounted in an upper jaw member of the articulator may rest, the other electrode being so arranged that it is connected with a lower jaw member of the articulator.

4,445,856

METHOD AND DEVICE FOR DETERMINING THE RELATIVE POSITION OF THE UPPER JAW AND LOWER JAW FOR THE PRODUCTION OF DENTURES

Robert Sturtzkopf, Wilhelm-Hey-Str. 14, Munich 60, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,300
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3104721
Int. Cl.³ A61C 9/00
U.S. Cl. 433—71 8 Claims

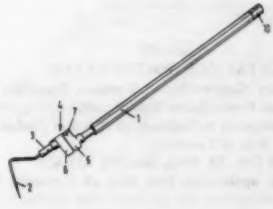
1. A device suitable for use with upper and lower jaw prostheses for determining the mutual alignment of dentally significant surfaces of the upper and lower jaws of a patient comprising: an arcuate bag, a wadding formed of a freely shapeable, hardenable material (14) contained in said bag; and holding means connected to said bag independently of the prostheses for inserting the bag between the prostheses, said holding means comprising tubular pockets (20) positioned on the exterior of said arcuate bag in a central plane of said bag lying generally parallel to the upper and lower jaws of the patient, said holding means further comprising a wire handle (24) having a central gripping portion and a pair of spaced shank portions (22) insertable in said pockets.

4,445,857

DENTAL CAVITY MEASURING INSTRUMENT

Arnoldus J. Borst, Waalwijk, Netherlands, assignor to Stichting Kennisexploitatie Nederland, Driebergen-Rijsenburg, Netherlands

Filed Mar. 8, 1982, Ser. No. 355,365
Claims priority, application Netherlands, Mar. 16, 1981, 8101279
Int. Cl.³ A61C 3/00
U.S. Cl. 433—75 6 Claims



1. An instrument for measuring the depth of a periodontal cavity comprising:

a probe needle,

a holder in which said needle is securable,

a handle,

a hinge having first and second hinge parts attached to said holder and handle respectively and pivotmeans about which said parts are pivotally connected to each other,

a spring having opposite ends engaged to said hinge parts respectively and an intermediate part situated generally adjacent and bridging said pivot means, said spring adapted to bias said hinge parts to a closed position of said

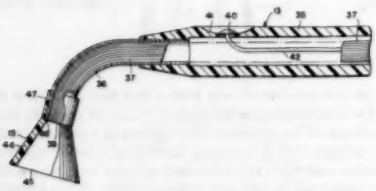
hinge, said spring having a substantially flat spring characteristic at least within the pivoting range of said hinge, said needle and holder therefor being pivotable relative to said handle only when a predetermined force sufficient to overcome said spring is exerted on said needle relative to said handle.

4,445,858

APPARATUS FOR PHOTO-CURING OF DENTAL RESTORATIVE MATERIALS

Clifford C. Johnson, Arlington Heights, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 19, 1982, Ser. No. 350,241
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—141 **20 Claims**



1. An apparatus for use in directing high-intensity light to an operative site for polymerizing a light-sensitive dental restorative material; said apparatus including a light source, a light-directing wand adapted to be hand-held by a user, and means for transmitting light from said source to said wand; wherein the improvement comprises

spacing means for engaging a tooth and for spacing the light-emitting end of said wand a predetermined distance from the restorative material at an operative site; said spacing means consisting essentially of a frusto-conical shield having a proximal end defining a reduced opening and a tooth-engagable distal end defining an enlarged opening; means at said proximal end for coupling said shield to the light-emitting distal end of said wand; said enlarged opening of said shield having a diameter within the range of about 0.35 to 0.85 inches; said shield having an interior surface sloping from the shield's axis at an angle within the range of about 15° to 35°.

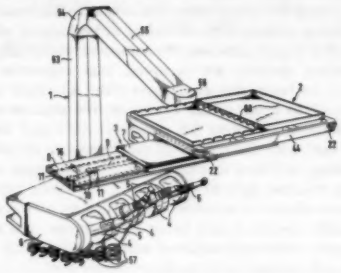
4,445,859

DENTAL EQUIPMENT STAND

Jürgen Hoffmeister, Genova-Nervi; Guiseppe Ravasini, Parma, both of Italy, and Franz-Xaver Boeckh, Schönebürg, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,431
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108826
Int. Cl.³ A61C *19/00*
U.S. Cl. 433—79 **15 Claims**

1. A dental equipment stand including a mounting component defining a dental repository table; a carrier for dental instruments which are withdrawably retained in individual holders in said carrier, said carrier being linearly horizontally displaceably supported below said dental repository table so as to be movable sideways away from said dental repository table to allow the instruments to be moved to one side to allow the dental repository table to be placed closely adjacent to the mouth of a patient; and a holder carriage coupled between and moveably supporting said carrier relative to said dental repository table, said holder carriage being linearly horizontally displaceably supported below said dental repository table, and said carrier being independently displaceable relative to said



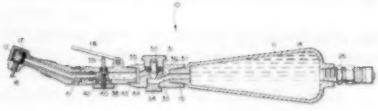
holder carriage, opposite the direction of displacement of said holder carriage.

4,445,860

RECHARGEABLE FLUID DRIVEN DENTAL TOOL

John H. Oehler, R.R. 15, Box 409, Brazil, Ind. 47834

Filed May 17, 1982, Ser. No. 378,886
Int. Cl.³ A61C *1/05*
U.S. Cl. 433—132 **1 Claim**



1. A dental hand piece including self-contained energy source comprising:

a main body with a hollow handle forming a rechargeable container to hold pressurized liquid, a head attached to said handle and a passage leading from said container to said head, said main body including an expansion chamber to allow said liquid from said container to expand to a gas;

a turbine mounted in said head next to said passage to receive gas therefrom with means extending outwardly from said turbine to mountingly receive a dental tool;

finger push lever means mounted to said main body and extendable into said passage to control the amount of fluid flow from said container to said turbine; and,

externally operable needle valve means mounted to said main body and extending into said passage means controllably allowing liquid within said container to expand to a gas as said liquid flows into said passage.

4,445,861

DENTURE SUPPORT SYSTEM AND METHOD

Michael A. Klepacki, 5403 Ellsworth, Dallas, Tex. 75206

Filed Nov. 8, 1982, Ser. No. 440,005
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—181 **6 Claims**

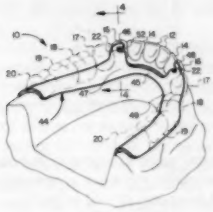
1. A denture support bracket for use in supporting a denture frame or the like, said bracket comprising:

a member having a generally planar backside forming a surface bondable to a mating surface formed on the exterior of a tooth, a generally horizontal bottom edge, and a recess for receiving and supporting a projecting portion of a denture support frame, said recess defining, in part, a pair of spaced apart upstanding legs of said bracket, each of said legs including a portion of said planar backside of said bracket.

4. A method for supporting a partial denture comprising the steps of:

providing two denture support brackets, each of said brackets having a generally horizontal support edge and a generally planar backside forming a surface for mounting said brackets on respective lingual tooth surfaces of two spaced apart mandibular anterior teeth, each of said brackets including means forming a recess for engaging spaced apart portions of a denture support frame, respectively;

forming a generally planar surface in the enamel of the lingual surface of each of two spaced apart anterior mandibular teeth and delimited by a generally horizontal support ledge on each of said teeth, respectively;



bonding said brackets to said teeth, respectively, with said recesses in said brackets opening in a generally upward direction, and with said support edges and said horizontal ledges engaged with each other, respectively, to transfer forces applied to said brackets to said respective teeth;

forming a denture support frame including said portions projecting into respective ones of said recesses in said brackets; and

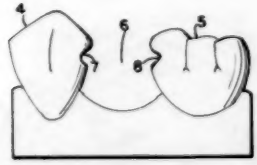
supporting said support frame by said brackets to retain said denture securely to minimize the transmission of forces of mastication between said support frame and the gingiva.

4,445,862

PRECISION PONTIC AND METHOD FOR MAKING IT

Vincent Chiaramonte, and Alice Barkow, both of Lindenhurst, N.Y., assignors to Mont-Cler Appliances Inc., Lindenhurst, N.Y.

Filed Nov. 25, 1981, Ser. No. 324,865
Int. Cl.³ A61C *13/10*
U.S. Cl. 433—191 **6 Claims**



1. Process of making a post for inserting a false tooth in a vacant space between first and second good teeth comprising the following steps:

cut first and second small indentations in the sides of each first and second good tooth facing the vacant space,

make a plaster model of the first and second good teeth,

insert wax in the gum saddle between the two existing teeth of the model,

insert pontic having interior and exterior portions, one portion having a first wing and the other portion having a second wing,

apply wax to the first wing so that it extends into the first indentation,

apply wax to the second wing so that it extends into the second indentation,

remove the pontic portions separately with the wax attached to them with the saddle wax adhering to one pontic portion,

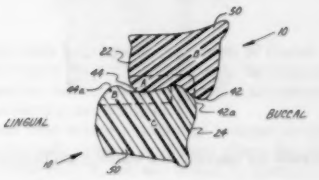
cast each pontic portion separately by the lost wax process, whereby the two castings may be inserted separately in the first and second indentations and fastened together.

4,445,863

ARTIFICIAL TEETH

Brien R. Lang, 1415 Folkstone, Ann Arbor, Mich. 48105, and Michael E. Razzoog, 6020 Vreland, Ypsilanti, Mich. 48197

Filed Aug. 30, 1982, Ser. No. 412,470
Int. Cl.³ A61C *13/08*
U.S. Cl. 433—212 **6 Claims**



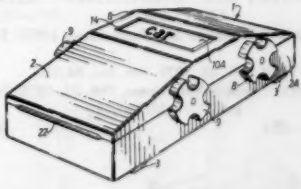
1. An artificial posterior denture tooth comprising a body shaped to conform generally to the shape of a natural posterior tooth and having wear surfaces, said body being formed of a plurality of resin materials varying in hardness, wear resistance, and strength, said resin materials being selectively distributed throughout said body to produce an uneven wear pattern on at least some of said surfaces.

4,445,864

READING AND SPELLING AID

John K. Price, 14 Pembridge Close, Charlton Kings, Cheltenham, England

Filed Feb. 2, 1982, Ser. No. 345,013
Claims priority, application United Kingdom, Feb. 3, 1981, 8103221
Int. Cl.³ G09B *17/00*
U.S. Cl. 434—173 **10 Claims**



1. A reading and spelling aid comprising two rotatable spools mounted with their axes of rotation parallel and spaced apart, a flexible strip extending between the spools and bearing letters of the alphabet arranged in a series of lines parallel to the axes of rotation of the spools, a reading window through which the letters on the strip may be viewed, only one line at a time, and operating means for rotating the spools to cause the lines of letters on the strip to move past the reading window only one at a time, the arrangement of letters on the strip being such that, in operation as successive lines of letters are viewed, only one at a time, through the reading window, a word is progressively built up within the reading window, the flexible strip bearing a plurality of sets of lines of letters for building up

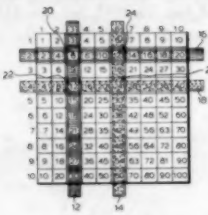
a corresponding number of words, said sets being arranged in a series lengthwise of the strip.

4,445,865

METHOD OF TEACHING MATHEMATICS

Jeffrey Sellon, Pound Ridge, N.Y., assignor to Cuisenaire Company of America, Inc., New Rochelle, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,064
Int. Cl.³ G09B *19/02*
U.S. Cl. 434—207 **2 Claims**



1. A method for teaching and learning multiplication comprising:

assigning unit power of ten values to strips of transparent material, each unit value comprising a different color and the composite color formed by one colored strip overlying another colored strip comprising the product of the unit value of said strips;

positioning said strips on a multiplication table array over the rows and columns representing the digits of the numbers to be multiplied and the color of the strip determining the unit values of said digits;

multiplying the digit value of each array element under an intersection of two strips by the unit value of the composite color formed by the overlying of said two strips; and,

summing the products of the digit values and the unit values to obtain the final value of the numbers being multiplied.

4,445,866

LEAD LINE BETWEEN AT LEAST TWO PERSONS, PARTICULARLY FOR CROSS COUNTRY SKIING OR SKI TOURING

Jaques Cillieres, 83, chemin des Fontanelles, 31500 Toulouse, France

Filed Feb. 23, 1979, Ser. No. 14,362
Claims priority, application France, Feb. 23, 1978, 78 05472
Int. Cl.³ A62B *35/00*
U.S. Cl. 434—253 **8 Claims**

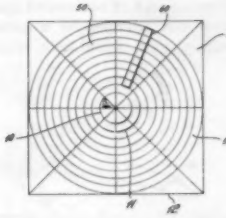
1. A device for connecting together at least two persons while skiing one behind another for facilitating the movement of the skier or skiers to the rear comprising at least two harnesses adapted to be worn by consecutive skiers, towline means connecting two consecutive harnesses in front to back relation, said towline means including safety coupling means adapted to disconnect the two skiers when a predetermined tension is exerted on said towline means.

4,445,867

EDUCATIONAL BOARD GAME

Ellie Berg, Chomedy, and Joseph Yowfoo, Montreal, both of Canada, assignors to Jeffrey Fishman, Montreal, Canada

Filed Oct. 23, 1981, Ser. No. 314,365
Int. Cl.³ H63F *9/18*; C09B *1/22*
U.S. Cl. 434—404 **7 Claims**



1. An educational game comprising in combination:

at least one pivotally mounted segmented disc having first indicia in at least one of said segments;

at least one spoke-like configuration arranged to extend radially outwardly of said disc whereby segments of said disc may be aligned with said spoke-like configuration, said spoke-like configuration having a plurality of areas extending in tandem radially outwardly of said disc;

second indicia in one of said areas corresponding to that of said segment and further common indicia in said segment and said area;

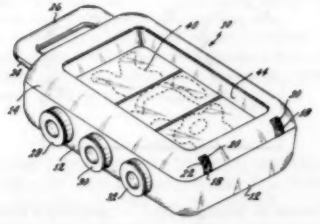
said game including a container, said spoke-like configuration appearing on a sheet or a like member removably mounted in said container, said container including a wall apertured in such manner said spoke-like configuration is visible therethrough and said disc being removably mounted exteriorly of said wall.

4,445,868

APPARATUS FOR PRODUCING RUBBINGS

Michael Nuttal, So. Pasadena, and Shoji Yamamoto, Westminster, both of Calif., assignors to Tomy Corporation, Carson, Calif.

Filed Aug. 2, 1982, Ser. No. 404,132
Int. Cl.³ B43L *13/00*
U.S. Cl. 434—88 **11 Claims**



1. An apparatus for producing rubbings which comprises:

a housing divided into a first section and a second section, said second section movable with respect to said first section;

at least two elements rotatably mounted in said first section, each of said elements having at least two independent surfaces with raised rubbing producing relief located on said surfaces, said elements rotatable in said first section so as to locate at any one time one of the surfaces in each of said elements in a working plane, said surfaces so located in said working plane capable of supporting a material capable of receiving a rubbing;

said second section positionable on said first section in a holding position so as to hold said material against said surfaces in said working plane during production of a rubbing;

each of said elements is triangular in cross section and includes three surfaces, each of said elements rotatably mounted in said first section such that said working surfaces are capable of each lying within said working plane;

each of said elements includes three members, each of said members having an essentially planar rectangular shaped surface with said surface including said raised rubbing producing relief located thereon;

each of said members having first and second triangular shaped side walls located on opposite sides of said rectangular shaped surface;

said three members of each of said elements fitting together so as to form a triangular prism with said rectangular shaped surfaces of said members forming the lateral faces of said prism and the totality of said first side walls together forming one of the bases of said prism and the totality of said second walls together forming the other of the bases of said prism;

each of said side walls including an elongated axle segment extending outwardly from said side walls with the axle segment on said first side wall coaxial with the axle segment on said second side wall, the totality of all of said axle segments in the first side wall of each of said three members of each of said elements fitting together to form a first axle when said members are fitted together, the totality of said axle segments on the second side wall of each of said three members of each of said elements fitting together to form a second axle when said members are fitted together, said first axle coaxial with said second axle;

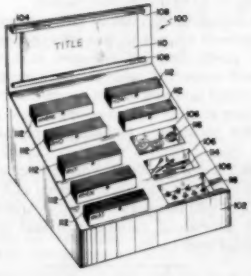
each of said elements rotatably mounted in said first section of said housing by said first and said second axles.

4,445,869

TEACHING METHOD AND APPARATUS

Myrna D. Wasserman, 6 Ronald Ter., Springfield, N.J. 07081

Filed Nov. 9, 1981, Ser. No. 319,470
Int. Cl.³ G09B *1/00, 19/00*
U.S. Cl. 434—156 **16 Claims**



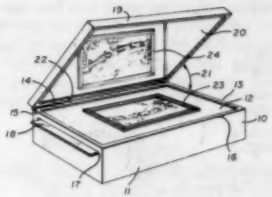
1. A teaching apparatus for developing an outline for the preparationn of a writing therefrom on a selected topic, said teaching apparatuus comprising means for stimulating in an individual the creation of a plurality of thoughts related to said topic, said stimulating means comprising a plurality of cards having a key word thereon for stimulating the creation of said thoughts related to said topic and said key word, said key word selected from the words comprising where, who, why, when, what and how, means for recording said created thoughts, and means for arranging said recorded thoughts into an outline for the development of a writing therefrom.

4,445,870

APPARATUS FOR OBSERVING FRAMED ITEMS

Gary G. Grana, 1224 N. Race, Arlington Heights, Ill. 60004

Filed Jun. 14, 1982, Ser. No. 388,018
Int. Cl.³ G09B *25/00*
U.S. Cl. 434—76 **1 Claim**



1. An apparatus for allowing purchasers of framed photographs, paintings or the like to observe how the framed photograph or painting will appear in its ultimate environment, said apparatus consisting essentially of:

a base, said base having a stationary transparent table surface, essentially along a horizontal plane, for placing a framed item thereon, and said stationary transparent table surface terminating at side edges;

means for changing the color or design of the table surface said means for changing the color or design of the table surface consisting essentially of a slotted section below the table surface for inserting various colored panels one at a time therein, and various colored panels of a size suitable for insertion therein;

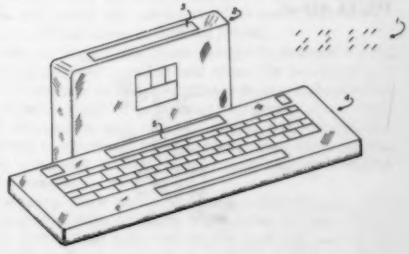
a reflecting mirrored surface, said reflecting mirrored surface connected to a side edge by a hinged connection and extending from one of the side edges of the table surface upward at an angle of from 40° to 50° in order to allow an object placed on the table surface to appear as if it were on a vertical surface.

4,445,871

TACTILE COMMUNICATION

John V. Becker, 280 Riverside Dr., New York, N.Y. 10025

Filed Nov. 12, 1981, Ser. No. 320,199
Int. Cl.³ G09B *21/00*
U.S. Cl. 434—114 **72 Claims**



1. A tactile cell comprising:

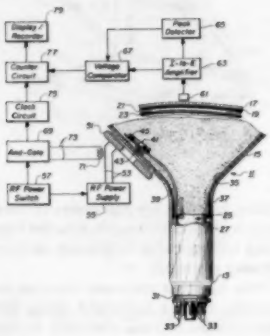
a number of one or more tactually perceptible indicia; and means for tactually conveying font information corresponding to the cell, said means being included in at least one of said indicia and corresponding to a first orientation of said one indicia which provides a first tactual sensation indicative of said font information.

4,445,872

METHOD OF DETECTING THE VAPORIZATION OF GETTER MATERIAL DURING MANUFACTURE OF A CRT

James G. Ottos, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,526
Int. Cl.[3] H01J 9/42
U.S. Cl. 445—3 10 Claims



1. In a method of vaporizing getter material from a getter container inside a vacuum electron tube, said method including heating said container and getter material until getter material vaporizes, the steps for determining at least one characteristic of interest of said vaporization including

(a) sensing light emitted from said container and material from at least the onset of said heating,

(b) producing a time-dependent sample signal from said sensed light,

(c) comparing said sample signal with time-dependent criteria derived from vaporizations with known characteristics, and

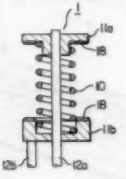
(d) deriving said characteristic of interest of said vaporization from said comparison.

4,445,873

METHOD OF PRODUCING MAGNETRONS

Mamoru Tsuzurabara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,194
Claims priority, application Japan, Aug. 13, 1980, 55-110205
Int. Cl.[3] H01J 9/38
U.S. Cl. 445—6 7 Claims



1. A method of producing a magnetron including a cylindrical anode and a cathode disposed on an axis of said cylindrical anode, said cathode having a first end shield connected to one input lead for said cathode, a second end shield connected to another input lead, a filament disposed between said first and second end shields, and a getter provided on at least one surface of opposed surfaces of said first and second end shields, said method comprising the steps of:

assembling said cathode;

coating a past containing a getter metal powder on at least one of the opposed surfaces of said first and second end shields, and drying the coated layer of paste;

carburizing said filament;

assembling a magnetron tube;

exhausting said magnetron tube; and

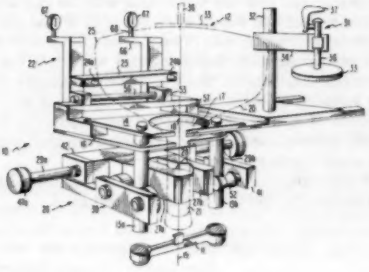
supplying said filament with a current for heating said filament during the exhausting step, whereby said coated layer of paste is sintered to produce a sintered substance of the getter metal powder.

4,445,874

APPARATUS AND METHOD FOR ALIGNING THE ENVELOPE AND ELECTRON GUN MOUNT ASSEMBLY OF A CRT

Frank T. D'Augustine, and Randal L. Berardi, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 348,022
Int. Cl.[3] H01J 9/18
U.S. Cl. 445—45 12 Claims



1. Apparatus for automatically aligning a cathode ray tube envelope with an electron gun mount assembly to be inserted into the neck of said envelope, wherein the position and orientation of said gun mount assembly are referenced to fixed reference means, said apparatus comprising:

means for supporting said envelope at a particular location with respect to said reference means;

means for engaging the neck of said envelope to orient said envelope with respect to said reference means; and

means for positioning said envelope in a particular disposition with respect to said reference means whereby said envelope and said gun mount are referenced to said reference means to align said envelope to said gun mount, said means for positioning including a plurality of bumpers equally spaced from a plane containing said reference means and being pivotable with respect to said reference means whereby the distance between said reference plane and each of said bumpers is equally variable to accommodate for dimesional variations in said envelope due to dimensional tolerances.

4,445,875

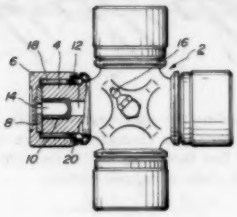
UNIVERSAL JOINT

Hironori Kosuda, Tokyo; Masaaki Takada, Kasukabe, and Hisashi Inoue, Tokyo, all of Japan, assignors to Matsui Universal Joint Manufacturing Company, Tokyo, Japan

Continuation of Ser. No. 212,508, Dec. 3, 1980, abandoned. This application Feb. 17, 1983, Ser. No. 467,313
Int. Cl.[3] F16C 1/24; F16D 3/26
U.S. Cl. 464—14 5 Claims

1. A universal joint provided with a journal cross having a journal center and projecting journal arms, the end of each arm forming an elongate oil reservoir, and an oil supply aperture communicating each reservoir with the journal center, the

joint further comprising an oil controller arranged in each oil reservoir, each controller being integrally formed and comprising an elongate cylindrical cup of one piece construction having a major portion of the length thereof snugly fitted within the corresponding reservoir, said elongate cylindrical cup including a closed hemispherical end arranged in the oil reservoir at said aperture and directed toward the center of the



journal cross, said hemispherical end providing a reinforced and enlarged surface exposed to the journal center, at least said hemispherical end being formed of a porous plastic material, the pores of the porous material providing means for permitting foreign substance filtering and passage of high temperature grease from the oil supply aperture to the oil reservoir and generally precluding passage of high viscosity grease from the oil reservoir back through the oil supply aperture.

4,445,876

ADJUSTABLE FRICTION OVERLOAD CLUTCH

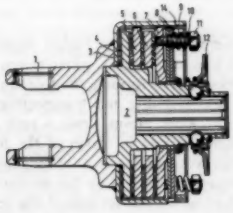
Hubert G. Entrup, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,528

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045070

Int. Cl.³ F16D *7/02*

U.S. Cl. 464—48 **5 Claims**



1. An adjustable friction overload clutch for protecting a drive-line, such as between a power take-off shaft on a tractor and an agricultural implement, comprising a plurality of parallel plates disposed in spaced relation to and extending transversely of and around an axis, friction discs located between said plates, means for supporting said plates, a Belleville spring washer assembly comprising at least one Belleville spring washer extending around the axis and having a radially inner edge closer to the axis and a radially outer edge more remote from the axis, said means including fixed stops for said at least one Belleville spring washer, one of said plates located adjacent said at least one Belleville spring washer, and bolts disposed radially outwardly from, generally parallel to and in angularly spaced relation about the axis, said bolts extend through said at least one Belleville spring washer and are attached to said plate located adjacent said at least one Belleville spring washer, wherein the improvement comprises that said one of said plates is in contact with said at least one Belleville spring washer adjacent the radially inner edge thereof and is in spaced relation from said at least one Belleville spring washer for the remainder of the radially outward extent thereof, said bolts extend through said at least one Belleville spring washer adjacent the radially outer edge thereof, a nut on each of said bolts adjacent the end of said bolts remote from the plate adjacent said at least one Belleville spring washer with said nut spaced from said at least one Belleville spring washer, springs held by said bolts between and in contact with said nuts and the opposite side of said at least one Belleville spring washer from the side in contact with the adjacent said one of said plates, and said nuts being adjustably positionable on said bolts for limiting the biasing force exerted by said at least one Belleville spring washer so that the adjustment of said nuts provides a reduced torque which is less than the maximum torque set when said at least one Belleville spring washer is initially assembled.

4,445,877

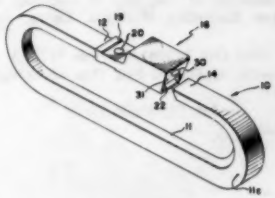
ADJUSTABLE LENGTH DRIVE BELT FOR VEHICLE BELT PULLEY SYSTEM

Michael Love, 2235 Arthur St., Merrick, N.Y. 11566, and Philip Forman, 39 Saratoga Dr., Jericho, N.Y. 11753

Filed Mar. 1, 1982, Ser. No. 353,362

Int. Cl.³ F16G *1/00, 5/00;* **F16L** *3/08;* **B65D** *63/00*

U.S. Cl. 474—255 **1 Claim**



1. An adjustable length pulley drive belt comprising:

flexible elongate pulley drive means, having a male end and an opposite end, for driving a pulley;

said opposite end including receiver means for receiving said male end, comprising:

resilient receiver means mounted on said opposite end including first and second longitudinally spaced oppossite ends, said first end of said receiver means being coupled to said opposite end of said flexible elongate pulley drive means;

said receiver means including a passage there throughh extending between said longitudinally spaced ends for receiving said male; end;

said passage being outwardly inclined in a direction away from said second end toward said first end of said receiver means and including an internal recess;

releasable securing blade means swingably mounted on said resilient receiver means in said recess for movement in a path transverse to the plane of said male end, between an inoperative position, permitting movement of said male end relative to said receiver means, and an operative position in which said securing blade means bites said male end to prevent removal of said male end from said receiver means;

said securing blade means including a belt-gripping knife edge end portion normally disposed in the path of said male end as said male end moves into said passage for movement thereby to said inoperative position in which said belt-gripping knife edge end portion bears against said male end, said securing blade means being movable by said male end from said inoperative position to said operative position when male end moves in an opposite direction away from said receiver means;

said receiver means including resilient mount means mounting an upper end of said blade means to normally urge said

belt gripping end portion to said operative position, but permitting swinging movement thereof by said male end toward the inoperative position as said male end moves into said passage, and permitting limited movement of said male end in said opposite direction as said securing blade means moves from said inoperative position to said operative position such that said knife edge end portion grips said male end to inhibit further movement in said opposite direction when said securing blade means reaches said operative position;

the portion of said blade means between said upper end and said belt gripping end portion bearing against an end wall of said internal recess when said blade means is in said operative position;

a release aperture being provided in said receptacle means in communication with said internal recess, said release aperture extending from said second end of said receiver means to said end wall of said internal recess to permit access to said securing blade means and to move said securing blade means from said operative position to said inoperative position.

4,445,878

CHAIN STRIPPER DEVICES AND ASSEMBLIES FOR MINING MACHINES

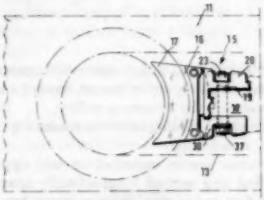
Horst Linke, Lunen; Josef Albers, Nordkirchen, and Helmut Erwien, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,783

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037585

Int. Cl.³ F16H *57/00*

U.S. Cl. 474—92 **12 Claims**



1. In or for a mineral mining machine frame assembly employing a chain wheel disposed in a plough box at one side of the assembly and a chain stripper device detachably supported on a mounting flange extending across the plough box, wherein said device comprises a one-piece element provided with a blade for separating a chain from the chain wheel, the element having a projection opposite the blade which engages on a first face of the flange, a complementary locking member which makes a shape-locked connection with the element, the locking member engaging on a lower face of the flange, and a threaded connector extending through alignable bores in the projection of the element, the flange and the locking member.

4,445,879

TOOTHED BELT

Mario Cicognani, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

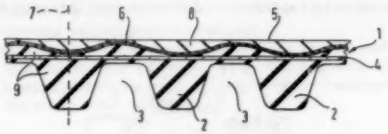
Filed Apr. 27, 1981, Ser. No. 257,586

Claims priority, application Italy, Jun. 5, 1980, 22557 A/80

Int. Cl.³ F16G *1/00, 5/00, 1/26*

U.S. Cl. 474—205 **11 Claims**

1. A toothed belt comprising an annular body of elastomeric material closed in the form of a ring, a tension-resistant insert member comprising a plurality of flexible and inextensible cords, parallel to and coplanar with one another and embedded in said annular body, said body having a first face for contacting a pulley and an opposite face, a toothing on said first face of the said body, and in that part of said body between said tension-resistant insert member and said opposite face an undulated surface dividing the elastomeric material of the annular body into two parts, the elastomer between the undulated surface and said first face being harder than the elastomer on the opposite side of the undulated surface.



4,445,880

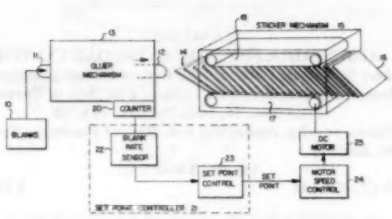
SPEED CONTROL FOR MANUFACTURING PROCESS

Loren C. Powers, Jr., Manchester, N.H., assignor to The International Paper Box Machine Co., Nashua, N.H.

Filed Jul. 20, 1981, Ser. No. 284,721

Int. Cl.³ B65G *47/26*

U.S. Cl. 493—28 **15 Claims**



8. In a system for manufacturing folded paper boxes, the system including a source of blanks, gluer means for folding and gluing the blanks thereby forming the folded paper boxes, stacker means for accumulating and transporting the folded paper boxes from the gluer means along a path in an overlapped configuration, the rate of travel of the folded boxes from the gluer means being independent of the rate of travel of the folded paper boxes transported by the stacker means, and motor means for driving the stacker means, the improvement of a motor control means for energizing the motor means and advancing the stacker means so that the overlapped boxes are evenly spaced in the stacker means along the path, said motor control means comprising:

A. sensing means mounted on said gluer means for indicating the passage of each box from the gluer means to the stacker means;

B. control signal means connected to said sensing means for converting the indication therefrom to a variable DC set point signal, the level of said variable DC set point signal being governed by the rate at which the articles pass from the gluer means to the stacker means; and

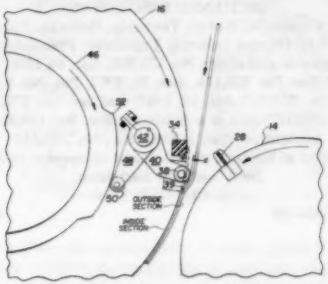
C. speed control means connected to said control signal means and the motor means for controlling the motor means in response to the transfer of each box from the gluer means to the stacker means, the rate of travel of the boxes transported by the stacker means is controlled by the motor means as a function of the level of said variable DC set point signal, said rate of travel being such that an even spacing is maintained between the boxes transported by the stacker means.

4,445,881

METHOD AND APPARATUS FOR IMPROVING NEWSPAPER FOLDING AND CUTTING MECHANISMS

Lee Bullen, Carrollton, Tex., and Carl J. Hermach, Gulfport, Fla., assignors to Publishers Equipment Corporation, Carrollton, Tex.

Filed Mar. 31, 1982, Ser. No. 363,900
Int. Cl.³ B65H *45/16*; B42C *1/04*
U.S. Cl. 493—424 **6 Claims**



1. In a folding and cutting mechanism for collecting, cutting and folding at least two web sections of a paper, the improvement comprising

a. a folding cylinder for receiving at least two web sections, an inner section and an outer section, one upon the other;

b. a cutting cylinder having blades for cutting the web sections into substantially equal lengths; and

c. intermittent expansion means within the folding cylinder having a first position and a second position, the effective radius of said folding cylinder being larger when said intermittent expansion means is in said second position than is said radius when said intermittent expansion means is in said first position, means for moving said intermittent expansion means between said first and second positions, said intermittent expansion means being disposed in said first position when said cutting blades are disposed to cut an inner web section from said web and disposed in said second position when said cutting blades are disposed to cut an outer section from said web, said positioning of said intermittent expansion means in said second position being adapted to lift the web sections off of the cylinder moving the previously cut end of the inner section a distance along the circumference of the cylinder thereby withdrawing the inner section from the path of the blades of the cutting cylinder.

4,445,882

TAG ATTACHER

Hideyuki Ueno, Yokohama, Japan, assignor to Ben Clements & Sons, Inc., South Hackensack, N.J.; Toska Co., Ltd. and Japan Bano'k Co., Ltd., both of Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,160
Claims priority, application Japan, Dec. 10, 1980, 55-174188
Int. Cl.³ B25C *1/00*
U.S. Cl. 493—376 **19 Claims**

1. A tag attacher for applying tag pins having a head portion, a body portion and a lateral rod base portion, said tag attacher comprising a tag attacher body, a longitudinally slitted hollow needle provided in a front portion of said tag attacher body, a push rod provided at the rear side of said hollow needle and capable of being moved in the direction of the axis of said hollow needle to thrust said lateral rod of a tag pin into, pass the same through, and force the same out of a front end of, said hollow needle, a movable lever for transmitting the force for moving said push rod, and a resilient member provided between said push rod and said lever, the resilient member being adapted to absorb a portion of the speed of moving of the lever

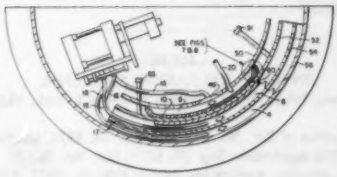
after said push rod engages said tag pin and to, upon compression, apply the full speed of moving to said push rod.

4,445,883

DEFORMABLE SUPPORT FOR FLUID PROCESSING CENTRIFUGE

Donald W. Schroendorfer, Brookline, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Filed Jan. 18, 1982, Ser. No. 339,910
Int. Cl.³ B04B *7/04*, *7/12*
U.S. Cl. 494—21 **7 Claims**



1. Apparatus for processing fluids in a centrifugal force field to separate constituent components of such fluids comprising in combination:

(a) a centrifuge having a rotor adapted to rotate at a sufficient speed to cause said components to separate;

(b) a flexible bag adapted to contain a first fluid to be separated into constituent components;

(c) a receiver container adapted to receive at least one component of said first fluid;

(d) mass means for initiating a flow of component of said first fluid from said flexible bag to said container, said mass means being disposed nearer the center of rotation of the rotor than the flexible bag and adapted to move against a surface of said bag.; and

(e) deformable support means having a recess conforming to the desired shape of said flexible bag and at least partially enclosing a surface of said bag furthest removed from the surface against which the mass means moves.

4,445,884

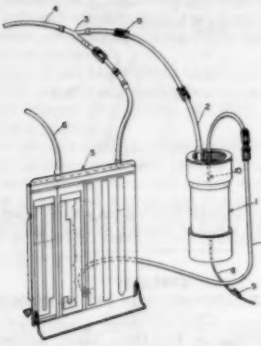
AIR PURGE UNIT FOR AUTO TRANSFUSION APPARATUS

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of, NY, assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Aug. 14, 1981, Ser. No. 292,425
Int. Cl.³ A61M *37/00*, *1/00*
U.S. Cl. 604—4 **6 Claims**

1. In an autotransfusion apparatus, a collection chamber for blood, an air purge means directly mounted on said collection chamber for purging the air within the collection chamber when blood and air within the collection chamber is put under positive pressure said air purge means comprising a housing, a

passageway in said housing in fluid communication with the interior of said collection chamber and having an outlet, a filter disposed in said passageway, said filter having a pore size smaller than the size of red blood cells, a oneway valve disposed in said passageway in series with the filter between said



filter and said outlet, said oneway valve permitting air to pass therethrough from the interior of said collection chamber and preventing air from entering said collection chamber, said filter permitting air to pass therethrough until blood fills said passageway between the interior of said collection chamber and the filter.

4,445,885

INSULIN RELEASING SUPPLIER

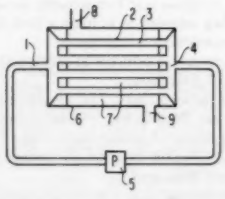
Koji Kifune, Nara, Japan, assignor to Unitika, Ltd., Magasaki, Japan

Continuation of Ser. No. 877,782, Feb. 14, 1978, abandoned. This application Sep. 25, 1979, Ser. No. 78,630

Claims priority, application Japan, Feb. 16, 1977, 52-17543; Feb. 24, 1977, 52-20024; Feb. 24, 1977, 52-20025; Mar. 23, 1977, 52-32587

Int. Cl.[3] **A61M** *1/03;* **B01D** *13/00*

U.S. Cl. 604—28 **10 Claims**



1. A method for supplying insulin to a patient which comprises connecting the patient to an insulin supplier comprising a casing and at least one tubular structure, said tubular structure being formed of hollow fibers and constituting a polymeric semipermeable membrane comprising a polymer selected from a cellulose, polyvinyl alcohol or polyamide and having pores of 100 Å to 2μ in size to provide an internal chamber inside of the tubular polymeric semipermeable membrane and an external chamber outside of the tubular polymeric semipermeable membrane, either the internal chamber or the external chamber having at least one fluid-inlet and at least one fluid-outlet, said hollow fibers having a thickness of about 10 to 50μ and an inside diameter of about 50 to 400μ, introducing blood or another body fluid of said patient into that chamber which has said at least one fluid-inlet and at least one fluid-outlet and providing an aqueous solution or emulsion of insulin in the other chamber, whereby insulin in an amount required for metabolism within the body is supplied to the blood or the body fluid in response to the blood glucose level through the polymeric semipermeable membrane between the internal and external chambers continually over a period of time.

4,445,886

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

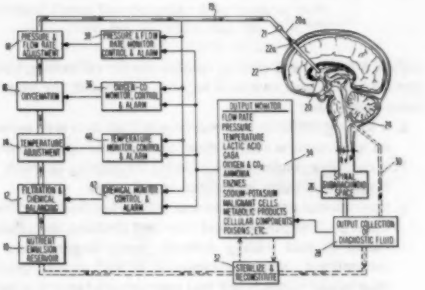
Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 275,117, Jun. 18, 1981, said Ser. No. 275,116, and Ser. No. 275,117, each is a division of Ser. No. 139,886,. This application Mar. 3, 1982, Ser. No. 354,346

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] **A61B** *5/14*

U.S. Cl. 604—28 **4 Claims**



1. A method of treating spinal cord injury, comprising:

(a) providing a physiologically acceptable oxygenated fluorocarbon emulsion;

(b) injecting said oxygenated liquid substantially continuously into the spinal subarachnoid space at a first point; and

(c) withdrawing said fluid from said spinal subarachnoid space at a second point, said first and second points being selected to establish a fluid pathway for said liquid around the vicinity of said spinal cord injury to provide oxygen to neurologic tissue in said vicinity.

4,445,887

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, and Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 275,117, Jun. 18, 1981, said Ser. No. 275,116, said Ser. No. 275,117, each is a division of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,682

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] **A61B** *5/14*

U.S. Cl. 604—28 **14 Claims**

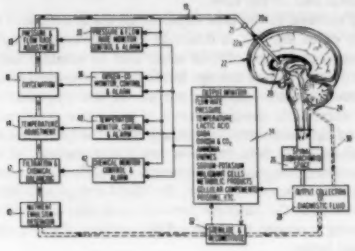
1. A method of treating hypoxic-ischemic neurologic tissue, in mammals, comprising:

(a) providing a physiologically acceptable oxygenated fluo-

rocarbon emulsion capable of transferring oxygen to hypoxic-ischemic neurologic tissue contacted thereby;

(b) injecting a substantially continuous stream of said fluid into the cerebrospinal fluid pathway at a first injection point;

(c) substantially continuously withdrawing fluid from said cerebrospinal fluid pathway at a second point which is



selected to create a circulation of said oxygenated fluorocarbon emulsion in the vicinity of said hypoxic-ischemic tissue, said circulation being sufficient to support significant aerobic respiration of a portion of said hypoxic-ischemic tissue;

whereby hypoxic-ischemic neurologic tissue will be oxygenated by said fluid.

4,445,888

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 275,117, Jun. 18, 1981, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, said Ser. No. 275,117, and Ser. No. 275,116, each is a division of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,898

Int. Cl.[3] **A61K** *31/00;* **A61M** *5/14*

U.S. Cl. 604—28 **5 Claims**

1. A method of treating symptoms of stroke or of suspected stroke in mammals comprising:

(a) providing a cerebrospinal physiologically acceptable synthetic oxygenatable fluorocarbon emulsion exhibiting a range of efficient oxygen exchange between unsaturated minimum and saturated maximum values of pO_2;

(b) oxygenating said emulsified fluid prior to injection to achieve pO_2 level of at least about 60% of said saturated maximum pO_2 value to provide an oxygenated injection fluid;

(c) following the onset of symptoms of a suspected stroke, injecting a substantially continuous stream of said oxygenated injection emulsion into the cerebrospinal fluid pathway at a first injection point;

(d) substantially continuously withdrawing fluid from said cerebrospinal fluid pathway at a second point which is selected to create a circulation of said oxygenated fluid in the vicinity of cerebral tissues susceptible to damage by said suspected stroke; and

(e) performing steps (b), (c) and (d) by oxygenating said fluid to a predetermined pO_2 level and injecting said oxygenated injection emulsion at a rate which together ensure that the pO_2 value of oxygenated emulsion withdrawn from said cerebrospinal fluid pathway is at least about twice said unsaturated minimum value of pO_2;

whereby said treatment may minimize the adverse effects otherwise expected of said stroke.

4,445,889

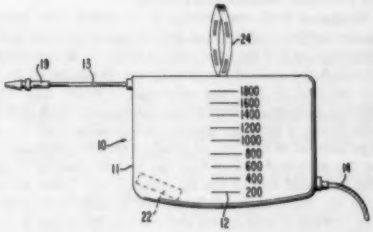
METHOD FOR DELIVERING AN AGENT WITH BIOCIDAL ACTIVITY IN A BODY FLUID RECEIVING CONTAINERS

Patrick S. Wong, Kowloon, Hong Kong; Jimmy B. Langston, San Jose, and Harold M. Leeper, Mountain View, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 137,538, Apr. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,507, Sep. 24, 1979, Pat. No. 4,241,733, which is a division of Ser. No. 804,962, Jun. 9, 1977, Pat. No. 4,193,403. This application Jul. 12, 1982, Ser. No. 397,507

Int. Cl.[3] **A61M** *31/00*

U.S. Cl. 604—49 **1 Claim**



1. A method for substantially preventing the development of an infection in a patient introduced through an indwelling catheter connected to a fluid receiving and storing container receptacle, which method comprises:

1. introduce an indwelling catheter into a patient;
2. connect the indwelling catheter to a container means for receiving and storing body fluids;
3. admitting the fluid receiving and storing container receptacle a biocidal dispensing means device for releasing an agent into the fluid receiving and storing container that inhibits the growth of infectious organisms in fluid in the receiving and storing container, said device comprising;
   (a) a body shaped, sized device means for admittance and long term retention in the fluid receiving and storing container receptacle, and, the body device means formed of a polymeric material that maintains its physical and chemical integrity in fluid in the receiving and storing container, said body means comprising;
   (b) at least one surface for releasing from the device means an agent into the fluid receiving and storing container;
   (c) an a chemoprophylactic biocidal agent dispersed in the polymeric body material that substantially prevents the growth of infectious organisms in the fluid receiving and storing container; and,
4. releasing the biocidal agent from the surface of the device, with the device continually dispensing the biocidal agent at a controlled rate in a biocidally effective amount into the receiving and storing container receptacle for inhibiting the growth of infectious organisms in the receiving and storing container receptacle and concomitantly their inhibiting the introduction of infectious organisms into the indwelling catheter, thereby preventing the development of a catheter induced infection in the patient.

4,445,890

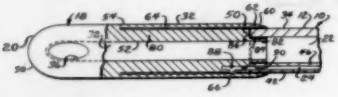
CATHETER

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 146,421, May 5, 1980, Pat. No. 4,361,152, which is a continuation of Ser. No. 930,386, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 767,425, Feb. 10, 1977, abandoned, which is a continuation of Ser. No. 581,251, May 27, 1975, abandoned. This application Aug. 25, 1982, Ser. No. 411,253

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—103 **1 Claim**



1. A retention catheter comprising:

an elongated shaft comprising an extruded tube having an outer surface, a distal end, a drainage lumen extending to the distal end of the tube, and an inflation lumen extending through the wall of the tube to the distal end of the tube;

a tip secured to the tube adjacent its distal end, said tip having a drainage channel communicating with said drainage lumen, a drainage eye communicating with the drainage channel of said tip, an axially-extending annular recess at the proximal end of said tip, and an annular tongue at the proximal end of the tip adjacent the inner surface of said tip, said tongue defining the radially-outwardly-facing surface of said recess and the axially-facing surface of said recess abutting against and being secured to the distal end of said tube;

an expansible annular sleeve of one-piece construction with said tip, said sleeve extending from the proximal end of said tip at its outer surface towards the distal end of said tip, the proximal end of said sleeve circumferentially surrounding the said tongue of said tip and defining the outer surface of said axially-facing annular recess; and,

opening means intermediate said sleeve distal and proximal ends communicating with the underside of said sleeve and with a passageway extending through a wall of the tip to said inflation lumen;

said tube being received within said axially-facing recess of said tip, and said sleeve proximal end being arranged to enshroud said tube,

the proximal end of said sleeve including an inner surface which is secured to the outer surface of the tube, the distal end of the sleeve being secured to the tip circumferentially around the tip, said tube distal end being secured to said axially-facing surface at the distal end of said tip recess and said axially-outwardly-facing surface of said tongue being secured to a radially-inwardly facing surface of said tube adjacent said tube distal end, thus to provide a catheter tip structure less likely to be separated from said tube during use.

4,445,891

CATHETER

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 146,421, May 5, 1980, Pat. No. 4,361,152, which is a continuation of Ser. No. 930,386, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 767,425, Feb. 10, 1977, abandoned, which is a continuation of Ser. No. 581,251, May 27, 1975, abandoned. This application Aug. 25, 1982, Ser. No. 411,252

Int. Cl.³ A61M *25/00*

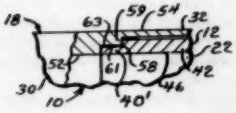
U.S. Cl. 604—103 **1 Claim**

1. A retention catheter comprising:

and elongated shaft comprising an extruded tube having an outer surface, a distal end, a drainage lumen extending to the distal end of the tube, an inflation lumen extending through the wall of the tube to the distal end of the tube, an opening extending through the wall of the tube communicating between the inflation lumen and the outer surface of the tube, said opening being spaced from the distal end of the tube, and an annular tongue adjacent the inner surface of the tube and at the distal end of the tube, said tongue defining an annular recess adjacent the outer surface of the tube at the distal end of the tube;

a tip secured to the tube adjacent its distal end, said tip having an outer surface, a drainage eye communicating with the drainage lumen of said tube, and an annular ledge at the proximal end of the tip defining an inwardly-facing annular recess adjacent an inner surface of said tip; and,

and expansible annular sleeve of one-piece construction with said tip, said sleeve extending from the proximal end of the tip adjacent said ledge at the outer surface of the tip to proximal the opening between the inflation lumen and the outer surface of the tube, the distal end of said sleeve being located at the juncture between said tube and said ledge and being arranged to enshroud the portion of said tube abutting said ledge,



the distal end of said sleeve including an interior surface which circumferentially surrounds and is secured to the outer surface of the portion of the tube abutting said ledge, the proximal end of the sleeve being secured to the outer surface of the tube circumferentially around the shaft, the outwardly facing annular surface of said tube recess being secured to the inwardly facing annular surface of said tip recess, the distal end of said tube tongue abutting and being secured to an axially-facing surface of said tip at the distal end of said tip recess, and the distal end of said tube abutting and being secured to an axially-facing surface of said tip at the proximal end of said tip recess remote from said sleeve proximal end thus to provide a catheter tip structure less likely to be separated from said tube during use, and

said opening communicating between the inflation lumen and the outer surface of the tube being located intermediate said sleeve distal and proximal ends at a point remote from said tube distal end, whereby the patency of said opening will not be compromised during the assembly of said tip with said tube.

4,445,892

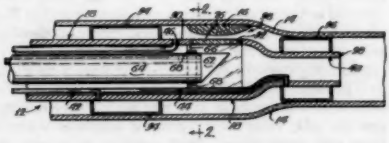
DUAL BALLOON CATHETER DEVICE

Hany M. G. Hussein, Lindenhurst; Marvin P. Loeb, Chicago, and Harvey S. Weiss, Buffalo Grove, all of Ill., assignors to Laserscope, Inc., Arlington Heights, Ill.

Filed May 6, 1982, Ser. No. 375,484

Int. Cl.³ A61M *29/02, 25/00*

U.S. Cl. 604—101 **28 Claims**



1. A catheter device for use within a blood vessel, comprising in operative association:

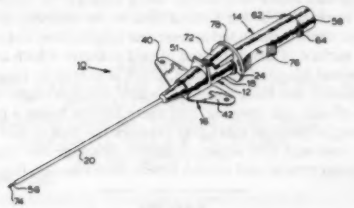
(a) an elongated tubular structure having a distal end and defining a window spaced from the distal end;
(b) first and second expandable balloons on the tubular structure and axially flanking the window;
(c) a first fluid passageway defined by the structure and in fluid communication with the first balloon;
(d) a second fluid passageway defined by the structure and in fluid communication with the second balloon;
(e) a first fluid channel defined by the tubular structure and having an exit aperture through the tubular structure between the first and second balloons;
(f) a second fluid channel defined by the tubular structure and providing a fluid passageway through the distal end; and
(g) an optic system carried by the tubular structure and operably associated with the window, the optic system being rotatable with respect to at least a portion of the tubular structure.

4,445,893

INFUSION APPARATUS

Raymond O. Bodicky, Oakville, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed May 13, 1982, Ser. No. 377,761
Int. Cl.³ A61M 5/00
U.S. Cl. 604—165 **5 Claims**



1. An intravenous catheter placement device comprising a catheter including a catheter hub having a relatively rigid proximal connector end portion for connecting the hub in fluid connection with another device, and a flexible cannula extending distally from the distal end of said catheter hub, said catheter hub having a frusto-conical portion intermediate the distal and proximal ends thereof and having an annular recess in the outer wall of said frusto-conical portion said recess having a distal wall and a proximal wall, said recess having first guide means thereon, and a catheter securing member of relatively resilient material having a hub portion and a pair of opposed wings integral with said hub portion, said securing member hub portion having having distal and proximal ends said securing member hub portion having an inner frusto-conical wall extending circumferentially continuously and having second guide means on the inner wall thereof complementary to said first guide means, said securing member being movable axially over said frusto-conical portion of said catheter hub and into said recess with said first and second guide means cooperating to orientate said wings in predetermined circumferential relation with said hub, the distal end of said securing member abutting the distal wall of the recess when the securing member is disposed in said recess to hold said securing member therein.

4,445,894

BAND FOR ANCHORING A CATHETER OR OTHER DEVICE TO THE BODY

Joseph Kovacs, Cranston, R.I., assignor to Baka Manufacturing Company, Inc., Plainville, Mass.

Filed Aug. 12, 1982, Ser. No. 407,456
Int. Cl.³ A61M 25/02
U.S. Cl. 604—179 **7 Claims**

1. A band for anchoring a catheter or other tubular device to the body comprising an extendable primary strap adapted to encircle the portion of the body to which the device is to be anchored and having upper and inner surfaces, said upper surface including a length of material to which the hooks of Velcro-like material can operatively attach and said inner surface intended to lie against the body,

fastening means connected to the primary strap for securing it in place on the body,

a secondary strap made of a Velcro-type material and connected intermediate its ends to the central portion of the upper surface of the primary strap with the hooks of the Velcro-type material facing upwardly from the upper surface of the primary strap,

each end of the secondary strap being adapted to be looped over the tube in opposite directions and with the hooks of the Velcro-type material operatively attaching to the hook attaching material of the primary strap to hold the tubular device.

4,445,895

PREPACKAGED, DISPOSABLE HYPODERMIC SYRINGES

Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.

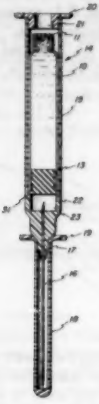
Division of Ser. No. 284,054, Jul. 16, 1981. This application Oct. 18, 1982, Ser. No. 434,844
Int. Cl.³ A61M 5/00
U.S. Cl. 604—193 **30 Claims**

1. A hypodermic syringe package for use in combination with a cartridge ampoule, said ampoule being sealed at its upper end by a slidable piston and at its lower end by a pierceable diaphragm and containing an injectable fluid therein, said package being adapted to prevent communication between an associated hypodermic syringe needle and the contents of said ampoule when said package is in a storage or pre-use configuration, which package comprises:

a syringe holder having a barrel; an end closure cap removably attached to one end of said barrel, and a double-ended needle and needle hub removably attached to the other end of said barrel; and restraint means within said barrel adjacent the needle/needle hub end thereof when in said storage configuration, said restraint means comprising either an annular rim, a single tab or multiple tabs on the inside of said barrel adjacent the upper end thereof,

said restraint means serving to prevent communication between the inner end of said double-ended needle and the contents of a cartridge ampoule when held within said barrel and whereby, upon interchange of said end closure cap and said needle and needle hub on the ends of said barrel to thereby assemble said syringe and

cartridge ampoule into a use configuration, said restraint means no longer prevents communication be-



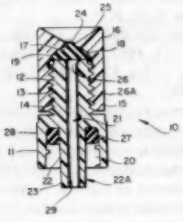
tween the inner end of said double-ended needle and the ampoule contents.

4,445,896

CATHETER PLUG

Cesare Gianturco, Champaign, Ill., assignor to Cook, Inc., Bloomington, Ind.

Filed Mar. 18, 1982, Ser. No. 359,218
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—238 **14 Claims**



1. A self-sealing catheter plug comprising:

(a) connector means having an end adapted to couple to a catheter and another end adapted for male-female coupling, said connector means having a passage therethrough;

(b) cap means having an end adapted for male-female coupling with the connector means at said another end, said cap means having an injection port therethrough aligned with said passage;

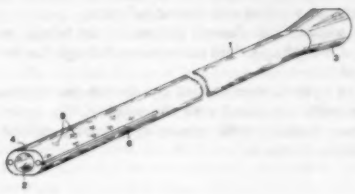
(c) septum means for sealing the port and adapted for piercing with a pointed instrument said septum means frictionally held and spatially compressed within a compression chamber between said connector means and said cap means.

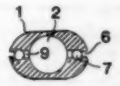
4,445,897

CATHETER FOR POSTSURGICAL DRAINAGE

Fred V. G. Ekbladh, P1 178, Särö, Sweden, S-430 40 and Hans Tillander, Humlegårdsgatan 3, Göteborg, Sweden S-412 74

Filed May 28, 1982, Ser. No. 383,014
Claims priority, application Sweden, Jun. 9, 1981, 8103617
Int. Cl.³ A61M *27/00*
U.S. Cl. 604—280 **3 Claims**





1. A catheter for post-surgical drainage of a wound comprising a flexible tube having a distal end and a proximal end, and having a centrally arranged inner lumen extending longitudinally thereof, said catheter being adapted to be connected at its proximal end to a suction means for withdrawing drainage through said lumen and further being adapted for its distal end to be implanted in the wound area to be drained, in which catheter there is provided at least one longitudinal slot opening in the surface of the distal end of said catheter which connects to a second longitudinal lumen which is at least as long as said slot opening and has a maximum width which is larger than the width of said slot opening, and there further being a plurality of through-openings extending between the base of said second lumen into said first lumen, whereby drainage can pass from the wound area to said second lumen, then into said first lumen.

4,445,898

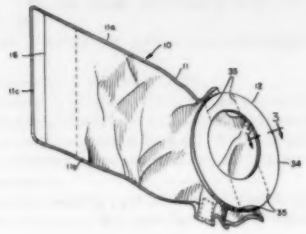
FECAL INCONTINENCE DEVICE WITH SEPARABLE RELEASE SHEETS

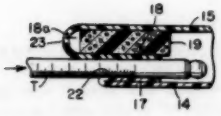
Marvin E. Jensen, Niles, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Mar. 16, 1982, Ser. No. 358,690
Int. Cl.³ A61F *5/44*
U.S. Cl. 604—337 **17 Claims**

1. A fecal incontinence device comprising a pair of panels of thermoplastic sheet material joined at their margins to define an elongated bag having an opening at one end thereof; an attachment ring of soft, pliable, stretchable and contractable plastic material having first and second opposite side surfaces and having outer and inner marginal edges; said inner edge defining an aperture corresponding generally in size and shape with said opening of said bag; said second surface of said ring being secured to said bag about the opening thereof and along a narrow zone adjacent to said inner marginal edge and spaced substantially from said outer marginal edge; said first surface of said ring being coated with a pressure-sensitive adhesive and being composed of a perineal portion, a coccygeal portion, and a pair of lateral portions; and protective release sheet means covering said adhesive coating of said ring; said means comprising a plurality of individually removable sections respectively covering the perineal, coccygeal, and lateral portions of said adhesive-coated surface; said perineal and coccygeal portions being diametrically disposed and extending between said

lateral portions; each of said lateral portions having a circumferential dimension substantially greater than each of said perineal and coccygeal portions; said individually removable sections of said protective release sheet means being separable from each other along lines of separation overlying the boundaries between said lateral portions and said perineal and coccygeal portions; said release sheet means having two sets of said lines of separation; whereby, on removal of said perineal and coccygeal sections of said release sheet means, said perineal and coccygeal portions of said ring may be sealed to the perineal and coccygeal areas of a patient prior to removal of said lateral sections of said release sheet means and the sealing of said lateral portions of said ring to such patient.





4,445,899

HYGIENIC ARTICLE FOR BLOTTING THE RECTAL PERINEUM REGION

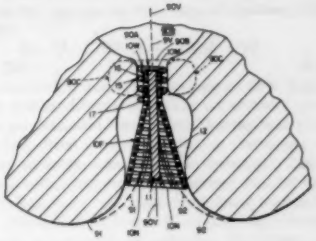
Helen I. Bond, 709 Olson Rd., Longview, Wash. 98632

Filed Jan. 21, 1982, Ser. No. 341,304
Int. Cl.³ A61B *19/00*
U.S. Cl. 604—385 **11 Claims**

1. Hygienic article for the rectal perineum region and including a blotter member flap, said article comprising:

A. a bundle of coherent hydrophilic fibers extending longitudinally along a central-axis and having a longitudinal-length from a lead-end to a trail-end, said fibrous bundle longitudinal-length including a relatively shorter lead-ward wick and a lengthier trailward blotter flap, said wick being positionable terminally within the anus so that the bundle lead-end is within the confines of the anal sphincter muscle to absorb rectal secretia and convey same along the bundle fibers toward the flap and which flap is nestably locatable immediately below the anus so as to conformably abut against the user's perineal walls, said bundle lengthier flap also being at least ten-fold more massive than the bundle shorter wick so as to reduce irritation and promote cleanliness at the perineal walls; and

B. a nodular button constrictably surrounding said blotter bundle portion and delineating the juncture of the bundle wick and flap, said nodular button comprising hydrophilic fibers compressed more closely together than are the fibers of said bundle wick and flap, said hygienic article at the nodular button portion being removably emplaceable within the anus and surrounded by the anal sphincter muscle to maintain the article in place and providing a retarder that slows the rectal secretia being conveyed from the bundle wick toward the bundle flap.



4,445,900

TABLESS SANITARY NAPKIN

Robert J. Roeder, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 10, 1982, Ser. No. 376,484
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—389 **2 Claims**

1. A sanitary napkin having adhesive attachment means comprising fluid absorbent batt adapted to be in absorbent contact with the wearer and a fluid impermeable baffle to position toward the garment facing side said attachment means consisting of an adhesive attachment pattern in the form of an X with the crossing portion of the X located in the approximate center portion of the napkin.

4,445,901

FABRIC CONDITIONING COMPOSITION

Stuart W. Beavan, Birkenhead, and Edwin Willis, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,506

Claims priority, application United Kingdom, Oct. 9, 1981, 8130556

Int. Cl.³ D06L *3/04;* D06M *13/46*

U.S. Cl. 8—103 5 Claims

1. A fabric conditioning composition consisting essentially of:

(i) a cationic fabric softening agent;

(ii) a material yielding halite ions in aqueous media; and

(iii) optionally a liquid base, when said liquid base is present, the composition contains from 4% to 20% of said cationic fabric softening agent and from 0% to 25% by weight of an electrolyte;

the composition yielding a pH of at least 6.0 when dispersed in from about 10 to about 800 parts by weight of water.

4,445,902

VAPOR PROCESS FOR MINERAL DYEING CELLULOSIC FABRICS

David A. Yeadon, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 4, 1983, Ser. No. 491,151

Int. Cl.³ C09B *67/00*

U.S. Cl. 8—474 5 Claims

1. A vapor process for mineral dyeing cotton textiles by:

(a) impregnating a cellulosic fabric with an alkaline chromate salt solution;

(b) exposing the yellow chromium wetted cellulosic fabric to sulfur dioxide vapors;

(c) drying and curing the now greenish colored cellulosic fabric;

(d) washing the mineral dyed fabric with a sufficient quantity of water to remove the residual and resultant unwanted salts, alkali, etc.

4,445,903

PROCESS FOR THE PREPARATION OF WOVEN FABRICS OF LOW AIR PERMEABILITY

Norihiro Minemura, Takatsuki, and Shigenobu Kobayashi, Toyonaka, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 26, 1983, Ser. No. 488,855

Claims priority, application Japan, Apr. 26, 1982, 57-68764; Aug. 12, 1982, 57-139122; Aug. 13, 1982, 57-139689; Feb. 14, 1983, 58-21618

Int. Cl.³ D06P *7/00, 1/651;* D06M *7/02*

U.S. Cl. 8—492 5 Claims

1. A process for the preparation of a woven fabric of low air permeability comprising preparing a woven fabric by use of a composite fiber of a splitting and severing type consisting of polyester components and polyamide components, each of which is to be splitted and severed to form an extra fine fiber of 0.001 to 0.8 denier size, as a warp and/or a weft; treating said woven fabric with an aqueous emulsion of a swelling agent for polyester and nylon under the conditions where nylon is mainly allowed to swell and then shrink; scouring and dyeing the woven fabric; and after calendering the woven fabric with the use of heated rollers rotated under pressure.

4,445,904

PROCESS FOR CONTINUOUSLY DYEING IN THE GEL STATE FIBER MATERIAL OF ACRYLONITRILE POLYMERS SPUN FROM ORGANIC SOLVENTS WITH CARBINOL- OR ANHYDRO BASE OF BASIC DYE

Manfred Hähnke, and Wolfgang Teige, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,374

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141082

Int. Cl.³ C09B *11/10;* D06P *1/41*

U.S. Cl. 8—538 9 Claims

1. A process for the continuous dyeing of fiber material of one or more acid-modified polymers or copolymers of acrylonitrile in the gel state, said fiber material having been produced by wet spinning from a spinning solution containing one or more organic solvents, which process comprises dyeing the fiber material with a solution of a carbinol base or anhydro base of a carboxyl- or sulfo-free N-arylated triarylmethane dyestuff, a carboxyl- or sulfo-free N-arylated diarylindolylmethane dyestuff, a carboxyl- or sulfo-free N-arylated oxazine dyestuff, a carboxyl- or sulfo-free N-arylated xanthene dyestuff, or a carboxyl- or sulfo-free N-arylated azine dyestuff in a dye bath containing water and the organic spinning solvent or solvents.

4,445,905

PROCESS FOR TRICHROMATIC DYEING OR PRINTING OF POLYAMIDE

Harry Schaetzer, Wehr, Fed. Rep. of Germany; Helmut Raisin, Riehen; Dieter Mäusezahl, Biel-Benken, both of Switzerland, and Ciba-Geigy AG, 03, Basel, Switzerland

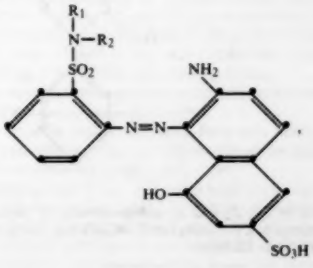
Filed Apr. 5, 1983, Ser. No. 482,168

Claims priority, application Switzerland, Apr. 8, 1982, 2206/82

Int. Cl.³ C09B *1/34;* D06P *3/06*

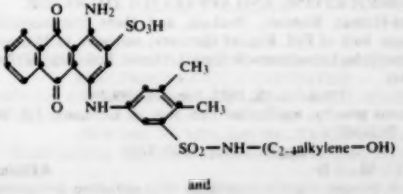
U.S. Cl. 8—641 15 Claims

1. In a process for the trichromatic dyeing and printing of natural and synthetic polyamide material with dyestuff mixtures, the improvement which comprises using a red dye of the formula



(1)

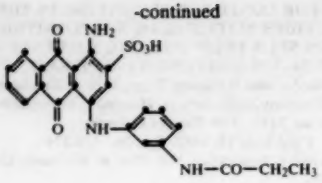
wherein R_1 is methyl or ethyl and R_2 is cyclohexyl or phenyl, together with a blue mixture of dyes of the formulae



(2)

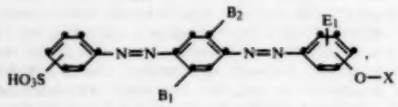
and

-continued



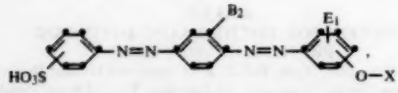
(3)

in the ratio of 90:10 to 10:90, and with a yellow or orange dye of the formula



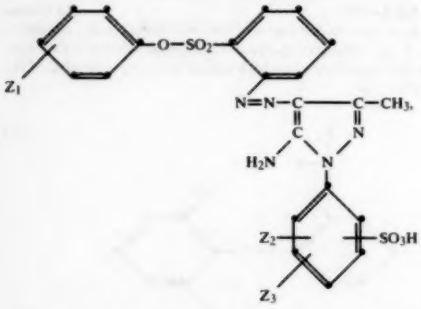
(4)

wherein B_1 is C_1–C_4alkyl or C_1–C_4alkoxy, each of B_2 and E_1 independently of the other is hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy, and X is straight chain or branched C_1–C_4alkyl or straight chain or branched C_2–C_4hydroxyalkyl or a mixture of the yellow and orange dyes of the formulae (4) and



(5)

wherein B_2, E_1 and X independently of the other are as defined for formula (4), in the ratio of 80:20 to 20:80, or a mixture of the yellow and orange dyes of the formulae (4), (5) and



(6)

wherein each of Z_1, Z_2 and Z_3 independently of the other is hydrogen, halogen, C_1–C_4alkyl or C_1–C_4alkoxy, in the ratio of 8:10:10, 10:80:10 to 10:10:80.

4,445,906

PROCESS FOR THE TREATMENT OF THE COMBUSTIBLE PORTION OF DOMESTIC WASTE FOR BRIQUETTING AND APPARATUS THEREFOR

Hanns-Helmut Riemann, Bochum, and Hans Sonnenschein, Essen, both of Fed. Rep. of Germany, assignors to Mannesmann Veba Umwelttechnik GmbH, Herne, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,295

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128560

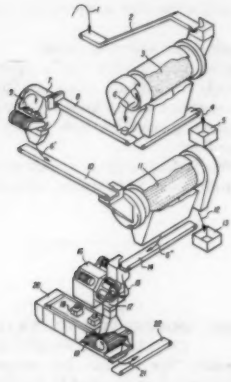
Int. Cl.³ C10L *5/00, 5/08*

U.S. Cl. 44—1 D **4 Claims**

1. A process for the treatment of a cellulose containing combustible portion of crushed domestic dried waste free from dense material, said process using a fine screening drum, a disintegrator, a coarse screening drum and a briquet press wherein said process comprises the steps of:

drying said waste to a residual moisture content of about 8–10%;

sifting fine inert material from said dried waste with said fine screening drum to form a combustible waste portion without fines;



introducing said combustible waste portion without fines into said disintegrator to shred and fray said combustible waste portion without fines; and

introducing said shredded and frayed combustible waste portion into said briquet press to form briquets having a high heating value.

4,445,907

ALCOHOL COMPOSITION STABILIZED AGAINST CORROSION BY THE USE OF AN AMINO TETRAZOLE

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,813

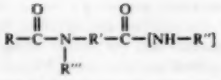
Int. Cl.³ C10L *1/22*

U.S. Cl. 44—53 **24 Claims**

1. A composition comprising

(i) a water-soluble alcohol; and

(ii) an effective corrosion-inhibiting amount of



wherein R is a C_{10}–C_{20}alkyl, alkeny, alkaryl, aralkyl, aryl, or cycloalkyl hydrocarbon group, R' is a divalent C_1–C_5 lower alkylene hydrocarbon group, R''' is alkyl, aryl, alkaryl, or aralkyl, and NH—R'' is an amino tetrazole group.

4,445,908

EXTRACTING ALCOHOLS FROM AQUEOUS SOLUTIONS

Alicia L. Compere, Knoxville; John M. Googin, and William L. Griffith, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 212,005, Dec. 1, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,775

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—56 **13 Claims**

1. A method for obtaining a mixture of an alcohol and a petroleum type hydrocarbon, comprising:

mixing a fermentation solution containing water and one or more alcohols selected from the group consisting of ethanol, isopropyl alcohol and n-butyl alcohol with a mixture of a petroleum type of hydrocarbon and a compound containing a mixture of multiple polyoxyalkylene units for a time sufficient to extract said alcohol from said fermentation solution into said mixture;

and separating excess water of said fermentation solution from said mixture containing the extracted alcohol.

4,445,909

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1980, Ser. No. 200,290

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—72 **10 Claims**

1. An internal combustion fuel composition consisting essentially of a major proportion of an unleaded motor fuel containing about 1 to about 10 weight percent of an ashless antiknock additive selected from the group consisting of 1,4-di-aminobutane and 1,3-diaminopropane.

4,445,910

GAS GENERATING SYSTEM AND PROCESS

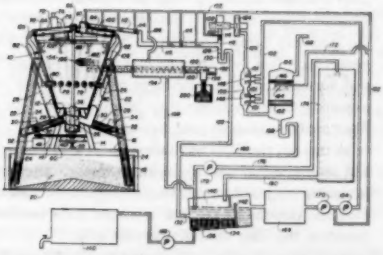
Edwin H. Zimmerman, R.D. #1, New Holland, Pa. 17557

Continuation-in-part of Ser. No. 231,987, Feb. 6, 1981, Pat. No. 4,348,211. This application Jul. 9, 1982, Ser. No. 396,869

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C10J *3/30, 3/32*

U.S. Cl. 48—76 **35 Claims**



1. A system to generate gas products having useful B.T.U. values from waste cellulosic materials capable of being sintered and charred and comprising in combination:

a. a metallic generator shell comprising a cone free of permanent insulation, positioned vertically, and tapering downwardly at a diverging angle of not substantially less than 35°, said shell also having means in the upper portion thereof to discharge the said products of combustion,

b. a closure for the top of said generator shell which with the walls of the shell forms a gas accumulating chamber in the upper portion of the shell,

c. material inlet means in the bottom of said shell,

d. means to feed waste material compactly and progressively into said inlet means for gradual movement upwardly in a manner to permit the angle of divergence of the shell to cause loosening of the material as it moves upwardly in the shell.

e. controlled air inlet ports spaced circumferentially around said shell substantially adjacent the vertical midportion of said shell and adapted to form a sintering type combustion zone with waste material only in the portion thereof above the level of said ports,

f. gas outlet means communicating with and extending from the upper portion of said gas accumulating chamber,

g. suction means downstream from the gas accumulating chamber to said shell and operable adjustably to induce the inlet of ambient air into said combustion zone through said ports,

h. agitating means supported in the upper portion of said shell and engageable with the upper portion of the material in said combustion zone and operable to agitate it to facilitate discharge of said products of combustion from said discharge means therefor, and

i. means communicating with said gas outlet means to receive gas therefrom and operable to separate the same from solid products of combustion contained therein.

26. A system to generate gas products having useful B.T.U. values from waste cellulosic materials capable of being sintered and charred and comprising in combination:

a. a metallic generator shell comprising a cone positioned vertically and tapering downwardly at a diverging angle and having a gas accumulating chamber in the upper portion thereof,

b. a closure extending across the top of said cone and a second panel similar to said closure extending across said cone below said closure to provide a heating space separated from the interior of said cone and having air inlet means,

c. material inlet means in the bottom of said cone,

d. means to feed waste material progressively into said inlet means for gradual movement upwardly in a manner to permit the angle of divergence of the cone to cause loosening of the material as it moves upwardly in the cone,

e. air inlet ports spaced circumferentially around said cone substantially adjacent the vertical midportion thereof and adapted to form a sintering type combustion zone within waste material in said cone in the portion thereof above the level of said ports, said combustion zone effecting heating of air within said heating space,

f. gas outlet means communicating with and extending from said gas accumulating chamber,

g. air conduit means extending from said heating space to said air inlet ports to provide heated air for combustion to said combustion zone in said cone,

h. agitating means movably supported in the upper portion of said cone and engageable with the upper portion of the material in said combustion zone and operable to agitate it to facilitate sintering of the material and discharge of the products of combustion from the upper portion of said cone, and

i. suction means communicating with said gas accumulating chamber and operable to withdraw gas and entrained particles of material from said chamber.

4,445,911

METHOD OF CONTROLLING OPERATION OF AN ELECTROSTATIC PRECIPITATOR

Leif Lind, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Dec. 15, 1981, Ser. No. 331,012

Claims priority, application United Kingdom, Dec. 17, 1980, 8040463

Int. Cl.³ B03C *3/04, 3/68*

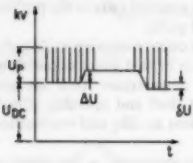
U.S. Cl. 55—2 **26 Claims**

1. A method of controlling the DC-voltage in an electro-

static precipitator having electrodes energized by pulses superimposed upon a preset DC-voltage, which comprises:

periodically eliminating said pulses and thereafter measuring a corona discharge current between said electrodes;

comparing said measured corona discharge current against a predetermined value; and



selectively adjusting the DC-voltage in accordance with said measured corona discharge current so as to maintain the DC-voltage at approximately the corona extinction voltage by increasing the DC-voltage when the measured discharge current is lower than said predetermined value and by decreasing the DC-voltage when the measured discharge current is higher than said predetermined value.

4,445,912

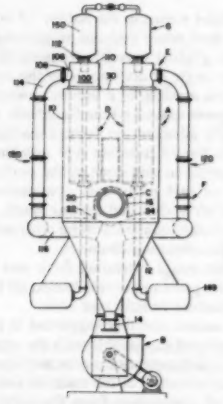
EFFLUENT AIR FILTRATION APPARATUS

Michael Volk; David A. Metzger, both of Mansfield, Ohio; Donald H. Ostby, and Robert R. Ostby, both of Muskegon, Mich., assignors to The Mike Volk Co., Inc., Mansfield, Ohio

Filed Feb. 4, 1982, Ser. No. 345,623

Int. Cl.[3] **B01D** *46/04, 50/00*

U.S. Cl. 55—283 **17 Claims**



1. An air filtration system comprising:

an enclosed housing having an inlet aperture for receiving air to be filtered, a lower collection region for accumulating particles filtered from the received air, a top wall having a plurality of openings, and a mounting flange surrounding each top wall opening;

a filter cartridge extending downward from each top wall opening into the enclosed housing, and including:

an upper filter medium mounting ring which is operatively connnected with the mounting flange,

a lower filter medium mounting ring, disposed substantially parallel to the upper mounting ring,

a joint bar extending between the upper and lower mounting rings and generally perpendicular thereto, the joint bar having a first column of outward extending elongated mechanical fasteners disposed at intervals between the upper and lower mounting rings and a plurality of apertures therethrough spaced from said first column of elongated mechanical fasteners with said apertures disposed at intervals between the upper and lower mounting rings,

a filter medium support grid having a multiplicity of apertures therein, the filter medium support grid being generally tubular and connected at one end with the upper filter medium mounting ring and at its other end with the lower filter medium mounting ring,

a woven metal mesh filter medium having a height sufficient to extend between the upper and lower mounting rings and a length between first and second vertical edges to extend around the filter medium support grid from the joint bar elongated mechanical fasteners to the joint bar apertures, the filter medium defining a first plurality of apertures adjacent the first filter medium vertical edge in alignment with the joint bar elongated mechanical fasteners, the joint bar elongated mechanical fasteners extending through the first vertical edge apertures, and a second plurality of apertures adjacent the second filter medium vertical edge and in alignment with the joint bar apertures, and

a second column of mechanical fasteners extending through the aligned joint bar and filter medium second vertical edge apertures to fasten the filter medium to the joint bar; and,

a plenum means disposed in fluid communication with the top wall openings for receiving filtered air therefrom.

13. An air filtration system comprising:

an enclosed housing having an inlet aperture for receiving air to be filtered, a lower collection region for accumulating particles filtered from the received air, a top wall having a plurality of openings, and an annular mounting flange surrounding each top wall opening, the mounting flange being mounted displaced from and parallel to the top wall by a sleeve portion;

an annular cartridge mounting gasket disposed on the mounting flange;

a filter cartridge extending downward from each top wall opening into the enclosed housing, and including an upper filter medium mounting ring, an annular filter cartridge mounting plate extending outward from the upper mounting ring and being disposed on the cartridge mounting gasket such that the cartridge mounting gasket provides a seal between the filter cartridge mounting plate and the mounting flange, a lower filter medium mounting ring, a filter medium support grid having a multiplicity of apertures therein, the filter medium support grid being tubular and connected at one end with the upper filter medium mounting ring and at its other end with the lower filter medium mounting ring, and a woven filter medium surrounding the filter medium support grid;

an annular exhaust plenum mounting gasket disposed on the filter cartridge mounting plate;

a plenum adjacent each top wall opening for receiving filtered air from the filter cartridge, the plenum including an annular exhaust plenum mounting ring disposed on the exhaust plenum mounting gasket such that the plenum is sealingly mounted to the filter cartridge mounting plate and the housing mounting flange; and,

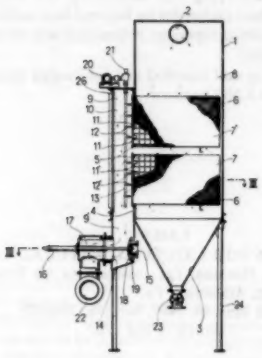
a plurality of mechanical fasteners extending through at least the exhaust plenum mounting ring, and the mounting flange such that the plenum and filter cartridge are selectively removable from the housing.

4,445,913

POWDERY DUST SEPARATING APPARATUS IN DUST COLLECTOR

Shinroku Nishiyama, 11-4, Komei-Cho, Takarazuka, Hyogo, Japan (665)

Filed Sep. 14, 1982, Ser. No. 418,169
Claims priority, application Japan, Feb. 26, 1982, 57-28098[U]
Int. Cl.³ B01D *41/00*
U.S. Cl. 55—302 1 Claim



1. A powdery dust separating apparatus, comprising:

a. a dust collector body, said body including:

(1) a vertically and longitudinally extending partition therein dividing the interior of said body into a filter chamber, and a gas chamber laterally spaced from said filter chamber,

(2) a suction pipe at the upper end thereof communicating with said filter chamber, for drawing powdery dust containing gas into said filter chamber, and

(3) a dust disposal passage at the lower end thereof communicating with said filter chamber, for discharging therethrough powdery dust separated from the gas;

b. mutually parallel, longitudinally spaced, vertically and laterally extending flat box-like filter members disposed in said filter chamber inserted into said partition, said filter members each having filter cloth spread over the outer faces thereof and having openings in ends thereof adjacent said partition;

c. a plurality of separators longitudinally separating said gas chamber into a plurality of gas passages, said gas passages each including a gas outlet at the lower end thereof and an atmospheric air inlet opposite said gas outlet;

d. compressed air pipes having air outlets protruding therefrom; each of said filter members having spaced apart venturi tubes attached to said openings, said air outlets of said compressed air pipes facing said venturi tubes; and

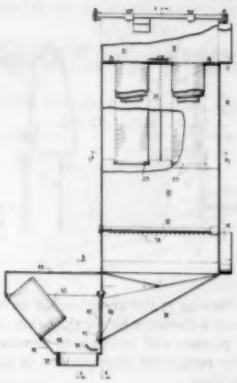
e. a valve arrangement in each of said gas passages, each valve arrangement including an air cylinder having a piston rod reciprocally longitudinally movable therein, an outlet closing valve and an atmospheric air inlet closing valve attached to an end of said piston rod so as to alternately respectively close said gas outlet while opening said atmospheric air inlet and close said gas inlet while opening said gas outlet with reciprocal movement of said piston rod.

4,445,914

INDUSTRIAL DUST FILTER WITH JET INDUCED REVERSE AIR CLEANING

Kenneth L. Richard, York, Pa., assignor to York-Shipley, Inc., York, Pa.

Filed May 28, 1982, Ser. No. 382,820
Int. Cl.³ B01D *46/04, 46/48*
U.S. Cl. 55—303 3 Claims



1. Industrial dust filter apparatus comprising:

a housing defining an upper clean air chamber and a lower dirty air chamber separated by a wall having at least a pair of openings therethrough, spaced from each other longitudinally of said chambers;

an elongated vertically positioned venturi in said dirty air chamber in fluid communication with said openings and extending downwardly therefrom;

at least two annular pleated cartridge type filters supported within the upper part of said venturi by said wall and each being aligned with one of said openings respectively, said filters extending downwardly to a point adjacent the upper end of the decreasing cross section of said venturi and being closed at their lower ends to expose the outer surface of said filters to the dirty air chamber;

means for positively venting clean air from said clean air chamber;

means for admitting dirty air to be filtered into said dirty air chamber so as to pass upwardly through said venturi, radially inwardly of said filters and axially out of said filters to said clean air chamber;

means defining a plurality of downwardly directed jet nozzles in said venturi and above the throat thereof;

means for supplying said nozzles with pressurized blasts of air to induce a reverse flow through said filters; and

means for removing particulate matter cleaned from said filters from the lower portion of said dirty air chamber.

4,445,915

DUST COLLECTOR FILTER CARTRIDGE AND STRUCTURE ATTACHMENT MEANS FOR SUSPENDING SAME FROM BAGHOUSE TUBE SHEET

James W. Robinson, Woodridge, Ill., assignor to Flex-Kleen Corporation, Chicago, Ill.

Filed Aug. 16, 1982, Ser. No. 408,250
Int. Cl.³ B01D *46/52*
U.S. Cl. 55—378 6 Claims

1. A combination of

A. a baghouse tube sheet having a plurality of holes therein;

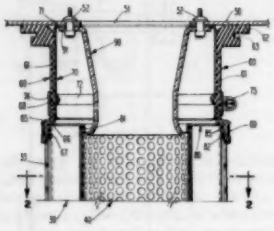
B. a small-diameter filter cartridge, said cartridge having an annular cap at its upper end, said cap having a depending outer flange having an exterior annular bead;

C. attachment means connected to said filter cartridge and

suspending said cartridge from said baghouse tube sheet and in flow communication with one of said holes, said attachment means being adapted for installation of the filter cartridge from either below or above the tube sheet, said attachment means comprising:

a. a boot having a hollow cylindrical body portion;

b. said boot having at the upper end of its body portion an outwardly extending flange having an annular groove in its exterior surface;



c. said boot having at the lower end of its body portion a skirt having a diameter larger than that of the cylindrical body portion and forming an annular shoulder receiving the peripheral edge portion of said cap of said filter cartridge;

d. said skirt having an annular groove in its inner surface receiving the annular bead of the cap of the filter cartridge; and

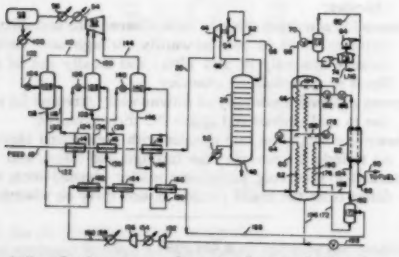
e. a steel band embracing said skirt and holding said bead in said annular groove of said skirt.

4,445,916

PROCESS FOR LIQUEFYING METHANE

Charles L. Newton, 3 Highland Ct., R.D. #7, Bethlehem, Pa. 18015

Filed Aug. 30, 1982, Ser. No. 412,686
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—17 **7 Claims**



3. A liquefaction process for natural gas including the separation in a scrub column of heavier hydrocarbons as a bottom stream from a methane-rich fraction as an overhead stream, comprising the steps of:

(a) introducing a natural gas feed stream into the liquefaction system at a pressure in the range of 600–2000 psia;

(b) cooling the feed stream in a series of heat exchangers in indirect heat exchange with a first refrigerant in a closed refrigeration system;

(c) reducing the pressure of the feed stream to a pressure which is below the critical pressure of both the overhead and bottom streams by a combination of isentropically expanding said feed stream while obtaining mechanical energy and intercooling at least a portion of the feed stream against the methane-rich overhead stream from the scrub column;

(d) introducing the intercooled and expanded feed stream as feed and as all of the reflux to the scrub column to separate the methane-rich fraction as an overhead stream and the heavier hydrocarbon fraction as a bottom stream;

(e) warming the methane-rich overhead stream in an intercooling heat exchange against the intercooling feed stream of step (c);

(f) compressing the warmed overhead stream to a high pressure in a compressor utilizing the mechanical energy derived from the expansion of step (c);

(g) cooling, liquefying and subcooling the methane-rich stream in a heat exchanger by indirect heat exchange with a second, multi-component, refrigerant in a closed refrigeration system;

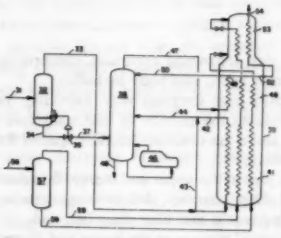
(h) withdrawing said liquefied and sub-cooled methane-rich stream as an LNG product.

4,445,917

PROCESS FOR LIQUEFIED NATURAL GAS

Chen-Hwa Chiu, Houston, Tex., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 10, 1982, Ser. No. 376,079
Int. Cl.³ F25J *1/02*
U.S. Cl. 62—25 **7 Claims**



2. In a process for purifying and liquefying a raw natural gas feed containing methane and hydrocarbon impurities of C_2 and higher against a refrigerant in a cryogenic main heat exchanger, which comprises cooling said raw natural gas feed to form a cold feed, distilling said cold feed in a distillation column to form a scrubbed overhead vapor rich in methane and a bottoms liquid rich in said hydrocarbon impurities, cooling said scrubbed overhead vapor against refrigerant in said heat exchanger, refluxing the distillation column with a portion of the cooled scrubbed overhead, and cooling the remainder of the cooled scrubbed overhead against refrigerant in said heat exchanger to form a purified liquefied natural gas, wherein the improvement comprises:

separating said cold feed to form a first feed vapor and a second feed liquid;

cooling said first feed vapor against said refrigerant in said heat exchanger;

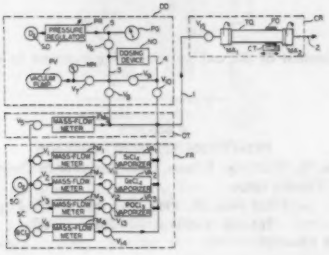
after distilling, cooling said scrubbed overhead vapor against refrigerant in said heat exchanger to a temperature sufficient to condense and subcool the overhead vapor and form a subcooled methane-rich liquid; and

introducing a portion of said subcooled methane-rich liquid for said refluxing to the distillation column solely by a liquid/liquid separation of said subcooled methane-rich liquid.

4,445,918
PROCESS AND APPARATUS FOR ON-LINE DEHYDROGENATION OF FIBER-DRAWING PREFORMS

Eros Modone, Turin, and Giacomo Roba, Cogoleto, both of Italy, assignors to Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 21, 1982, Ser. No. 390,801
Claims priority, application Italy, Jun. 22, 1981, 67857 A/81
Int. Cl.³ C03B 37/07
U.S. Cl. 65—3.12 11 Claims

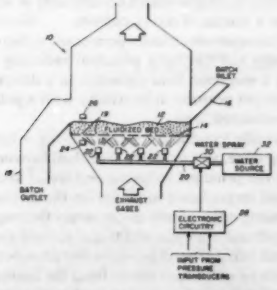


1. A process for manufacturing fiber-drawing preforms of reduced hydrogen content, comprising the steps of:
(a) continuously entraining vapors of silicon compounds and doping agents by a flow of carrier gas to a high-temperature reaction chamber for deposition on a substrate;
(b) establishing a connection between the flow path of said carrier gas and a source of elemental deuterium under pressure for continuously admixing said elemental deuterium with said flow; and
(c) inserting into said connection a gas-penetrable partition for controlling the rate of admixture to displace significant amounts of hydrogen by deuterium in a deposit of doped silica formed on said substrate.

4,445,919
IN SITU RAPID WASH APPARATUS AND METHOD

William E. Cole, Sudbury; Drew P. O'Connell, Townsend, and James L. Griffith, Newton, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Mar. 14, 1983, Ser. No. 474,769
Int. Cl.³ C03B 5/26, 3/00
U.S. Cl. 65—27 9 Claims

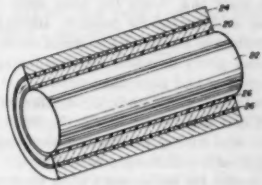


1. In heat exchange apparatus for preheating glass batch supported in a fluidized bed on a perforate distributor plate exposed to flue gases from a glass-making furnace,
a method for cleaning deposits from said perforate distributor plate, in situ, comprising delivering a volume of solvent in liquid form to said distributor plate during a time interval, said volume of solvent and said time interval selected so that said solvent is in the liquid state when it contacts said distributor plate and the total time during which said solvent is delivered to said plate is less than one percent of the time said surfaces are exposed to flue gases.

4,445,920
METHOD OF MAKING GLASS-TO-METAL SEAL (HEADER)

Rex L. Smith, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1982, Ser. No. 450,861
Int. Cl.³ C03C 29/00
U.S. Cl. 65—59.21 8 Claims

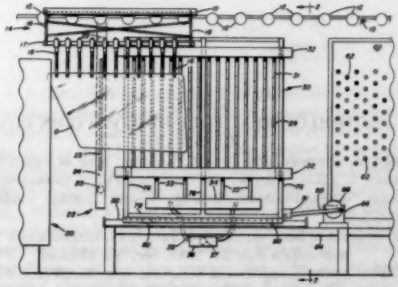


1. A method of forming a three-tier glass and metal component with mechanical and chemical bonds between the glass and metal comprising the steps of:
placing a glass rod between a metal sleeve and a metal pin, said glass rod having a coefficient of expansion that approximates said metal pin and metal sleeve;
heating said pin, rod, and sleeve to 1050° C. for five minutes in a furnace; and
maintaining a dry hydrogen atmosphere in said furnace during said heating step.

4,445,921
TEMPERING GLASS SHEETS BY COOLING COMPRISING SUBLIMATION QUENCHING

Terry A. Bennett, Verona; Herbert W. Eilenfeld, Brackenridge, and Dewitt W. Lampman, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 24, 1983, Ser. No. 460,322
Int. Cl.³ C03B 27/00
U.S. Cl. 65—114 29 Claims



1. A method of tempering a glass sheet comprising heating said sheet to an elevated temperature range sufficient for tempering and rapidly cooling said glass sheet from said elevated temperature range by directing a first tempering medium at a temperature significantly below said elevated temperature range at the opposite major surfaces of said glass sheet, said tempering medium having an initial heat transfer capacity

sufficient to cool said major surfaces at a rate such that said sheet develops a maximum temporary tensile stress insufficient to cause said glass sheet to fracture and gradually changing the composition of said cold tempering medium by mixing a second tempering medium at a temperature significantly below that of said glass sheet and having a greater heat transfer capacity than said initial heat transfer capacity in such a manner as to increase gradually the heat transfer capacity of the resulting mixture of cold tempering media directed toward said opposite major surfaces.

21. A method of tempering a glass sheet comprising heating said glass sheet to an elevated temperature range sufficient for tempering and moving said glass sheet in a given direction into a quenching position between a pair of sets of exit orifices while said exit orifices are stationary, and tempering medium is applied therethrough toward the opposite major surfaces of said glass sheet and, when the glass sheet decelerates as it approaches said quenching position, starting to reciprocate said exit orifices in unison with an initial stroke in the direction opposite said given direction and continuing to reciprocate said orifices after said glass sheet stops at said quenching position so as to insure continuous relative movement between the glass sheet and said exit orifices during both the entry of the glass sheet into said quenching position and its subsequent quenching at said quenching position.

23. Apparatus for tempering a glass sheet comprising glass sheet heating means, a cooling station including a source of dry, pressurized air, means to store a sublimable material under pressure at a temperature sufficiently cold to store said sublimable material in a liquid state, a delivery system comprising an uninsulated portion containing dry air, a pair of opposite sets of exit orifices and means to selectively deliver said dry air under pressure to said exit orifices for delivery toward said glass sheet, means to convey said glass sheet from said heating means into a quenching position between said sets of exit orifices in said cooling station while delivering said pressurized air through said exit orifices, valve means to discontinue the application of dry air to said delivery system, means to selectively deliver said sublimable material through said delivery system including valve means constructed and arranged to control the delivery of said sublimable material to said uninsulated portion to purge said dry air from said delivery system through said exit orifices and then deliver said sublimable material initially in gaseous form mixed with said dry air in increasing concentrations of said sublimable material in the gaseous state and finally to deliver a mixture of said sublimable material in a mixture of gas and soft, solid, cold, sublimable particles of increasing concentration of said particles.

4,445,922

METHOD OF HEAT POLISHING PATTERN CUT GLASSWARE

Vadim V. Eremeev, and Jury A. Guloian, both of Gus-Khrustalny, U.S.S.R., assignors to Gusevsky Fulual Gosudarstvennogo Nauchno-Issledovatelskogo Insitut Stekla, Vladimir, U.S.S.R.

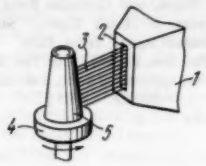
Continuation of Ser. No. 223,075, Jan. 7, 1981, abandoned. This application Feb. 23, 1982, Ser. No. 351,510

Claims priority, application U.S.S.R., Apr. 24, 1979, 2757714

Int. Cl.[1] **C03B** *29/04*

U.S. Cl. 65—120 **3 Claims**

1. A method of heat polishing pattern cut glassware by subjecting the surface thereof to high heat, wherein the heat polishing is carried out in a single acting pass by a beam of concentrated heat flow with sequential movement thereof along the entire surface of the glassware being heat polished, the selectable effective width of the concentrated heat flow being such as to heat only a small portion of the space pattern of the ware being processed over its entire height at a time,



each element of the cut pattern being exposed to equal heat stress.

4,445,923

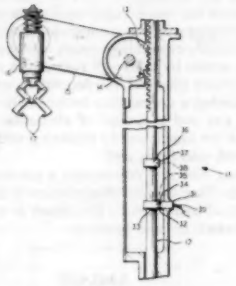
POSITION SENSING DEVICE

Donivan M. Shetterly, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 30, 1982, Ser. No. 454,513

Int. Cl.[1] **C03B** *9/40;* **G08C** *21/00*

U.S. Cl. 65—158 **10 Claims**



1. In a glassware forming machine having mechanisms for forming articles of glassware from gobs of molten glass in a timed series of predetermined forming steps in response to a plurality of control signals, apparatus for sensing the position of a mechanism associated with one of the forming steps comprising:

an electrical load;

an oscillator having an input connectable in series with said load to a source of direct current;

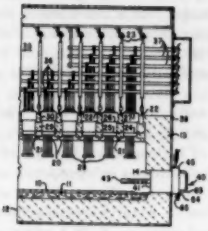
an electromagnet electrically connected to the output of said oscillator and having a principal radiating surface from which a magnetic field emanates in a direction toward a fixed target position in proximity with a path traveled by the mechanism; and

an electrically conductive target having a leading edge, a lagging edge, and a cutting face therebetween opposingly facing the principal radiating surface of said electromagnet, said target being mounted on the mechanism so that the leading edge of said target enters the magnetic field as the mechanism moves said target toward the target position and being shaped between the edges so that the cutting face of said target tapers from the leading edge to the lagging edge in a direction toward said electromagnet, the taper of said target being determined when the cutting face of said target opposingly faces the principal radiating surface of said electromagnet, whereby said oscillator becomes detuned as the cutting face of said target enters the magnetic field to reduce the measurable output voltage across said load.

4,445,924
AUXILIARY SIDE HEATER FOR A FLOAT GLASS FORMING CHAMBER

Earl L. May, Irwin, and William W. Baltzer, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 1, 1982, Ser. No. 383,414
Int. Cl.³ C03B *18/22*
U.S. Cl. 65—182.3 **10 Claims**

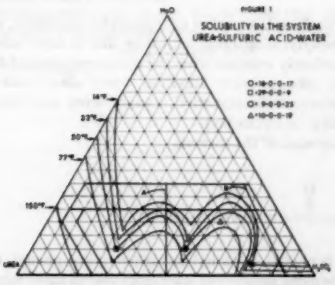


1. An apparatus for forming flat glass by the float process comprising an elongated basin containing a pool of molten metal, a roof and sidewalls supported over the basin defining an enclosed forming chamber, the sidewalls spaced above side portions of the basin so as to provide access openings along the sides of the chamber, portable side seal members removably inserted into the access openings to close the openings, means for delivering a stream of molten glass onto the molten metal at one end of the chamber, means at the opposite end of the chamber for withdrawing a formed glass ribbon from the chamber, and main heating elements in the upper portion of the chamber, the improvement comprising: at least one of the side seal members carrying an auxiliary electric heating element extending substantially horizontally into the chamber so as to extend into close proximity to edge portions of the ribbon of glass being formed, the heating element being provided with cantilever support by the side seal member so as to provide the portion of the heating element extending into the chamber with restricted horizontal width and with vertically open space adjacent thereto so that the edge portions of the glass ribbon are exposed to heat from both the auxiliary heating element and overlying portions of the main heating elements.

4,445,925
METHODS OF PRODUCING CONCENTRATED UREA-SULFURIC ACID REACTION PRODUCTS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 5, 1981, Ser. No. 318,629
Int. Cl.³ C05C *9/00*
U.S. Cl. 71—28 **52 Claims**

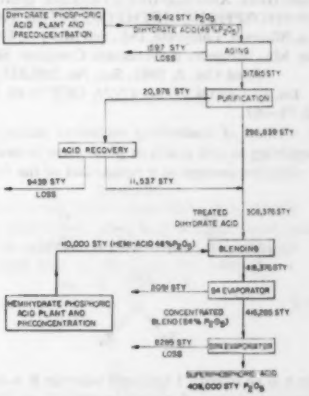


1. A method for producing concentrated solutions of urea and sulfuric acid of predetermined composition which method comprises the steps of: (i) simultaneously adding urea, concentrated sulfuric acid, and optionally water to a reaction zone at relative rates corresponding to the concentration of each respective component in said predetermined composition and within the ranges of about 5 to about 75 weight percent urea, about 5 to 85 weight percent sulfuric acid, and 0 to about 35 weight percent water, in which said urea and sulfuric acid are introduced to said reaction zone separately of each other and, in combination, constitute at least about 65 weight percent of the feed to the reaction zone, (ii) continuously agitating said reacting liquid phase formed by the addition of said urea, sulfuric acid, and water to said reaction zone during the addition of said urea, acid and water to rapidly disperse said urea, acid, and water therein, (iii) cooling said reacting liquid phase during the addition of said urea, acid and water by an amount sufficient to maintain said liquid phase at a temperature of about 176° F. or less and below the incipient decomposition temperature of said predetermined composition, and (iv) recovering from said reaction zone a product solution having said predetermined composition.

4,445,926
PROCESS FOR BLENDING PHOSPHORIC ACIDS OF DIFFERING IMPURITY CONTENT

Harold E. Mills; David L. Murdock, both of Lake City; Richard M. Ramer, Gainsboro, and Francis M. Sale, Lake City, all of Fla., assignors to Occidental Chemical Co., Los Angeles, Calif.

Division of Ser. No. 215,885, Dec. 5, 1980, Pat. No. 4,376,756.
This application Nov. 5, 1981, Ser. No. 318,502
Int. Cl.³ C05B *7/00*
U.S. Cl. 71—34 **8 Claims**



1. A liquid fertilizer produced by ammonation of a blended phosphoric acid having an R-value no greater than about 0.86, where the R-value of an phosphoric acid is one hundred times the ratio of the MgO analysis by weight divided by the P_2O_5 analysis by weight of said phosphoric acid, said blended phosphoric acid having been made by a process comprising blending a sufficient amount of at least one purified dihydrate process phosphoric acid having an R-value less than 0.86 with at least one phosphoric acid produced by a hemihydrate process and having an R-value greater than 0.86, to produce said blended phosphoric acid having an R-value no greater than about 0.86; wherein said purified dihydrate process phosphoric acid is purified by aging a dihydrate process phosphoric acid for sufficient time to allow at least some magnesium-containing solids to precipitate from said acid and separating at least some of said precipitated magnesium-containing solids from said dihydrate process phosphoric acid by filtration through a filter

aid to produce said purified dihydrate process phosphoric acid having an R-value less than 0.86; and producing a liquid fertilizer by a process comprising ammonating said blended phosphoric acid having an R-value less than 0.86.

4,445,927

HERBICIDAL COMPOSITIONS CONTAINING N-(PHOSPHONOMETHYL)-GLYCINE

Antal Gimesi, Budapest; József Baracskai, Balatonalmádi; Ferenc Fodor, Füzfogyártelep; Antal Gaál, Füzfogyártelep; András Horváth, Füzfogyártelep, and Zoltán Kolonics, Galatonalmádi, all of Hungary, assignors to Nitrokemia Iparтelepek, Füzfogyártelep and Növenyvedelmi Kutato Intezet, Budapest, both of, Hungary

PCT No. PCT/HU80/00012, 371 Date Aug. 25, 1981, 102(e) Date Aug. 25, 1981, PCT Pub. No. WO81/01787, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 23, 1980, Ser. No. 296,414

Claims priority, application Hungary, Dec. 28, 1979, NI 234

Int. Cl.[3] **A01N** *37/10*

U.S. Cl. 71—86 **2 Claims**

1. Herbicidal compositions comprising a combination of N-(phosphonomethyl)-glycine and α-naphthylacetic acid in a ratio in the range from 2:1 to 5:1 or a non-phytotoxic salt of these compounds.

4,445,928

HERBICIDAL AMINOSULFENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE TRIESTERS

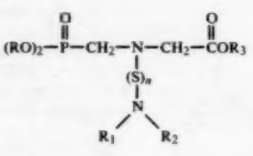
James A. Sikorski, Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,327

Int. Cl.[3] **A01N** *57/22, 57/24;* **C07F** *9/40, 9/65*

U.S. Cl. 71—87 **28 Claims**

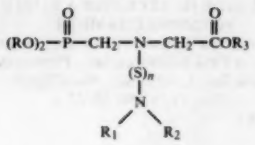
1. A method of controlling undesired plants which comprises applying to said plants or plant growth medium a herbicidally effective amount of a compound of the formula



(I)

wherein n is an integer 1 or 2 and wherein R is selected from the group consisting of phenyl, naphthyl, or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, cycloalkyl, alkyl, alkyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkoxy, lower alkylthio, cyano, lower alkoxycarbonyl, bis(aryloxy)phosphinyl wherein said aryl portion thereof corresponds to a group selected from R; phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkyl and lower alkoxy; acyl or aroyl; or R_1 and R_2 are independently selected from the aforerecited groups and joined together to form a cyclic structure having 4–8 atoms therein and R_3 is lower alkyl or aralower alkyl.

10. A compound of the formula



(I)

wherein n is an integer 1 or 2 and wherein R is selected from the group consisting of phenyl, naphthyl, or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, cycloalkyl, alkyl, alkyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkoxy, lower alkylthio, cyano, lower alkoxycarbonyl, bis(aryloxy)phosphinyl wherein said aryl portion thereof corresponds to a group selected from R; phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkyl and lower alkoxy; acyl or aroyl; or R_1 and R_2 are independently selected from the aforerecited groups and joined together to form a cyclic structure having 4–8 atoms therein and R_3 is lower alkyl or aralower alkyl.

4,445,929

HERBICIDAL ESTER DERIVATIVES OF N-ALKYLTHIO AND N-CYCLOALKYLTHIO-N-PHOSPHONOMETHYL-GLYCINONITRILE

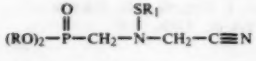
James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,325

Int. Cl.[3] **A01N** *57/22;* **C07F** *9/40*

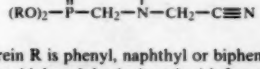
U.S. Cl. 71—087 **21 Claims**

1. A method of controlling undesired plants which comprises contacting said plants or plant growth medium with a herbicidal amount of a compound of the formula



wherein R is phenyl, naphthyl or biphenylyl or phenyl, naphthyl or biphenylyl substituted with from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is alkyl or cycloalkyl.

8. A compound of the formula



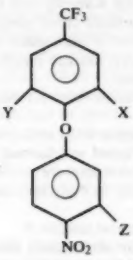
wherein R is phenyl, naphthyl or biphenylyl or phenyl, naphthyl or biphenylyl substituted with from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is alkyl or cycloalkyl.

4,445,930
HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 939,086, Sep. 1, 1978, which is a division of Ser. No. 808,415, Jun. 20, 1977, Pat. No. 4,185,995, which is a division of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1983, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1982, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,921
Int. Cl.[3] A01N *9/20*
U.S. Cl. 71—105 12 Claims

1. A herbicidal composition comprising a compound of the formula



wherein

X is a cyano group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

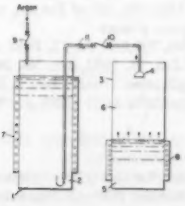
Z is a hydroxy group, an alkoxy group having up to 6 carbon atoms, an alkyl group having up to 4 carbon atoms, a halogen atom, an amino group, an alkylthio group having up to 4 carbon atoms, a cyano group, a carboxyalkyl group having up to 4 carbon atoms, or an agronomically-acceptable salt thereof, a carbalkoxyalkyl group having up to 6 carbon atoms, an alkanoyloxy group having up to 4 carbon atoms, or a carbamoyloxy group having up to 6 carbon atoms,

and an agronomically-acceptable carrier.

4,445,931
PRODUCTION OF METAL POWDER

Robert B. Worthington, Albany, Oreg., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 200,109, Oct. 24, 1980, abandoned. This application Jan. 20, 1982, Ser. No. 340,925
Int. Cl.[3] B22F *9/28*
U.S. Cl. 75—0.5 B 9 Claims



1. A process for production of metal powder comprising reacting a halide of the metal, in vapor form, with a fine spray of molten sodium, the temperature of the reaction being below the melting point of the metal.

4,445,932
METHOD OF RECOVERING FERRONICKEL FROM OXIDATED NICKEL ORES

Boris P. Onischin; Valery D. Linev, both of Leningrad; Alexandr E. Burochkin, Kirovogradskaya; Sergei G. Mitsev, Kirovogradskaya; Viktor R. Keller, Kirovogradskaya; Ivan S. Chernyshev, Kirovogradskaya; Viktor V. Lakisov, Kirovogradskaya; Valentin P. Moiseev, Kirovogradskaya; Jury A. Romanenkov, Leningrad, and Tamerlan G. Khakimov, Kirovogradskaya, all of U.S.S.R., assignors to Gosudarstvenny Proektny I Nauchno-Issledovatelsky Institut Gipronikel, Leningrad, U.S.S.R.

Filed Jul. 12, 1982, Ser. No. 397,415
Int. Cl.[3] C22B *23/02, 4/04;* C21B *11/10*
U.S. Cl. 75—11 20 Claims

1. A method of recovering ferronickel from oxidated nickel ores, comprising the steps of:

preparing an initial charge of ore with a reducing agent,

roasting the initial charge and producing a hot cinder in one roasting furnace,

simultaneously and independently roasting flux in another roasting furnace,

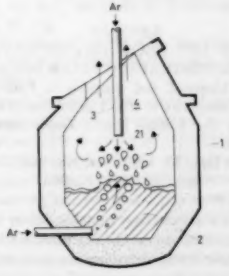
mixing said hot cinder and said hot roasted flux, thus producing a ready-for-use charge, and

electrically smelting said charge.

4,445,933
METHOD OF REFINING MOLTEN STEEL

Tetsuya Saito, and Hiroshi Mori, both of Aichi, Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Nov. 30, 1982, Ser. No. 445,515
Int. Cl.[3] C21C *5/34*
U.S. Cl. 75—59 4 Claims



1. A method of refining molten steel to obtain a steel of particularly low oxygen content characterized by injecting inert gas into molten steel in a refining vessel through the bottom of the vessel, and at the same time blowing inert gas from the top of the vessel so that atmosphere in the vessel may be kept almost completely inert during the refining.

4,445,934

METHOD OF MANUFACTURING ALUMINUM BY USING BLAST FURNACE

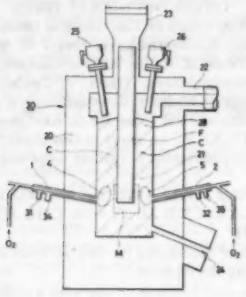
Masao Fujishige; Masayuki Dokiya; Tetsuya Kameyama; Harumi Yokokawa; Seiichi Ujiie; Kenzo Fukuda, and Akihiro Motoe, all of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,595

Claims priority, application Japan, Jun. 22, 1982, 57-107330

Int. Cl.³ C22B *21/02*

U.S. Cl. 75—68 A **5 Claims**



1. A method of smelting alumina using a blast furnace and comprising the steps of:

filling the blast furnace with a carbon material for combustion;

directing oxygen gas into said carbon material from the periphery of the furnace so as to form a plurality of combustion regions in which combustion of said carbon material takes place and which extend from the periphery of the furnace toward the center thereof and, at the same time, to form a high-temperature reduction zone in and about the center of the furnace, said high-temperature reduction zone being spaced apart from said combustion regions;

introducing into said high-temperature reduction zone and without contacting said combustion regions, a mixture of an alumina-containing material and a carbon material for reduction; and

reducing the alumina of said alumina-containing material to aluminum in said high-temperature reduction zone with said carbon material for reduction.

4,445,935

METHOD FOR THE RECOVERY OF SILVER FROM WASTE PHOTOGRAPHIC FIXER SOLUTIONS

Franz A. Posey, Concord, and Aloysius A. Palko, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 13, 1982, Ser. No. 449,312

Int. Cl.³ C22B *11/06*

U.S. Cl. 75—118 P **8 Claims**

1. A method for recovering metallic silver from a spent photographic fixer solution containing therein silver ions complexed by oxidizable complexing agents, comprising the steps of:

introducing the fixer solution into an aqueous alkaline solution containing an adequate amount of sodium hypochlorite to effect destruction by oxidation of the silver complexing agents,

contacting the resulting combined solution with an aqueous solution containing hydrazine in an effective amount to form a colloidal precipitate of silver; and

thereafter recovering the silver precipitate from the combined solution.

4,445,936

METHOD OF MAKING INELASTICALLY COMPRESSIBLE DUCTILE PARTICULATE MATERIAL ARTICLE AND SUBSEQUENT WORKING THEREOF

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Witec Cayman Patents, Ltd., Cayman Islands

Continuation of Ser. No. 111,634, Jan. 14, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,637

Int. Cl.³ B22F *3/00*

U.S. Cl. 75—228 **8 Claims**

1. A method of producing an article in the form of a fired powdered metal which is then crush formed and compressed to desired shape, comprising the steps of:

(1) mixing together predetermined amounts of particulate material and binder whereby said binder covers substantially all of the surfaces of the particles of said powdered metal, said particles of particulate material having a high degree of sphericity, the size range of said particles being kept to a minimum,

(2) forming said mixture from (1) into a desired configuration,

(3) removing the binder from said configuration in (2),

(4) sintering the stripped and formed material from (3) according to a time-temperature profile to provide predetermined pore volume to material volume ratio of hermetic pores,

(5) cooling said material, and

(6) crush forming by isostatically pressing said material to compress the material from (4), the volume of compression approaching but not exceeding the volume of said pores.

4,445,937

PNEUMATIC STOWING OF CONSTRUCTION MATERIAL COMPRISING CALCIUM ALPHA- AND BETA-SULPHATE HEMIHYDRATES

Friedr. Bassier, Duisburg; Fritz Adrian, Ratingen, and Dieter Deuster, Hilden, all of Fed. Rep. of Germany, assignors to Ruhrkohle AG and Steag AG, both of Essen, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,463

Int. Cl.³ C04B *11/10*

U.S. Cl. 106—109 **14 Claims**

11. A construction material for underground tunnel construction, comprising 60% by weight selected from calcium alpha-sulphate hemihydrate and calcium beta-sulphate hemihydrate, 30% by weight of flue dust obtained burning mineral coal, and 10% by weight of an additive selected from natural forms of coarse grained anhydrous calcium sulphate, limestone or a mixture thereof.

4,445,938

HYDROGENATED STARCH HYDROLYSATE

Francoise Verwaerde, Lambersart; Serge Gosset, Lestrem, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

Continuation of Ser. No. 109,066, Jan. 2, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,222

Claims priority, application France, Jan. 8, 1979, 79 00370

Int. Cl.³ C13K *1/06*; C07G *3/00*; C08B *31/00*; C12N *9/28*

U.S. Cl. 127—29 **14 Claims**

1. Hydrogenated starch hydrolysate characterized by a glucid spectrum corresponding to:

a content of monosaccharides (DP=1) less than 14%,

a content of disaccharides (DP=2) less than 35%,

a content of oligosaccharides of DP 4 to DP 10 ranging from 42% to 70%,

a content of polysaccharides of DP higher than 10 less than 32%, and

a content less than 3% of polyols of DP higher than 20.

4,445,939

STRIPPING AND CONDITIONING SOLUTIONS FOR TREATING COATED SUBSTRATES AND METHOD FOR THEIR USE

James V. Hodson, 1650 E. 500 South, Fruit Heights, Utah 84037

Filed Aug. 19, 1982, Ser. No. 409,544
Int. Cl.³ C23G 5/02
U.S. Cl. 134—2 20 Claims

1. A stripping and conditioning solution useful for removing coatings from coated substrate and conditioning the substrate for subsequent coating treating consisting essentially of a mixture of (1) a solvent composition comprising a chlorinated solvent and a liquid alcohol containing at least three carbon atoms, (2) a wetting composition comrising basic metal ammonium salt of an aromatic sulfonic acid, and a non-ionic surface active material, (3) a vapor suppressant.

16. A process for stripping a coating from a substrate and conditioning the resulting substrate for subsequent treatment with another surface coating which comprises applying to the coated substrate a thin film of a stripping solution as defined in claim 1, allowing the solution to remain on the coating until substantially stripped and then removing the stripped coating from the substrate.

4,445,940

PROCESS TO REMOVE CORROSION DEPOSITS USING AQUEOUS-BASE FERROMAGNETIC FLUIDS

Karen F. Hulford, and Jerry W. Price, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Nov. 30, 1982, Ser. No. 445,559
Int. Cl.³ C23G 1/00
U.S. Cl. 134—2 14 Claims

1. A process for the removal of corrosion deposits from corroded metal surfaces which comprises contacting said corroded metal surfaces with an aqueous-base ferromagnetic fluid in an amount effective to remove corrosion deposits and thereafter removing said aqueous-base ferromagnetic material and corrosion deposits from said metal surface.

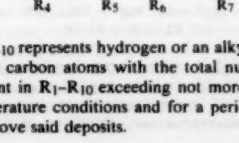
4,445,941

PROCESS FOR CLEANING METAL SURFACES

Ronald D. Mathis, and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 22, 1982, Ser. No. 401,033
Int. Cl.³ C23G 5/02
U.S. Cl. 134—3 9 Claims

1. A process for the removal of poly(arylene sulfide) deposits from metal surfaces comprising contacting the deposits with at least one diaryl ether, represented by the general formula



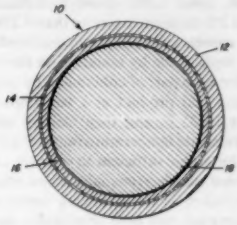
where R_1–R_{10} represents hydrogen or an alkyl radical having from 1 to 4 carbon atoms with the total number of carbon atoms present in R_1–R_{10} exceeding not more than about 20, under temperature conditions and for a period of time sufficient to remove said deposits.

4,445,942

METHOD FOR FORMING NUCLEAR FUEL CONTAINERS OF A COMPOSITE CONSTRUCTION AND THE PRODUCT THEREOF

Bo-Ching Cheng; Herman S. Rosenbaum, both of Fremont, and Joseph S. Armijo, Saratoga, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Nov. 26, 1979, Ser. No. 97,378
Int. Cl.³ G21B 3/06
U.S. Cl. 148—6.3 11 Claims



1. A method of producing a container for nuclear fuel for service in nuclear fission reactors, comprising the steps of:

(a) providing a casing of a metal selected from the group consisting of zirconium and zirconium alloys;

(b) depositing a steam permeable, porous thin layer of copper superimposed over the inside surface of said metal casing;

(c) oxidizing the inside surface of said metal casing with de-aerated steam subsequent to depositing the thin layer of porous copper thereon to thereby provide a layer of oxide of the metal selected from the group consisting of zirconium and zirconium alloys intermediate said inside surface of the metal casing and the porous copper superimposed over said inside surface of the metal casing; and,

(d) thereafter depositing a second layer of copper on the initially deposited thin layer of porous copper.

4,445,943

HEAT TREATMENTS OF LOW EXPANSION ALLOYS

Darrell F. Smith, Jr., and Edward F. Clatworthy, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Sep. 17, 1981, Ser. No. 302,974
Int. Cl.³ C21D 7/14; C22F 1/10
U.S. Cl. 148—12.3 15 Claims

1. The method for providing elevated temperature notch strength in wrought products made of an alloy consisting essentially of about 45% to about 55.3% nickel, up to about 5% cobalt, about 1.5% to about 5.5% columbium, about 1% to about 2% titanium, no more than 0.2% aluminum, up to about 0.1% carbon and the balance essentially iron, which comprises annealing said product at a temperature of about 1600° F. to about 1925° F. and then heating said solution treated product in the intermediate temperature range of about 1425° F. to about 1550° F. for a time sufficient to overage said product in the range of about 8 to 32 hours, with the proviso that said intermediate temperature and time are upwardly graduated as the annealing temperature is increased, and then heat treating said product in a lower temperature range of about 1100° F. to 1400° F. for at least about 8 hours to provide in said product a notch strength of at least about 20 hours at 1000° F. and 100 ksi.

4,445,944

HEAT TREATMENTS OF LOW EXPANSION ALLOYS

Darrell F. Smith, Jr., and Edward F. Clatworthy, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Sep. 17, 1981, Ser. No. 302,975
Int. Cl.[3] C21D 7/14; C22F 1/10
U.S. Cl. 148—12.3 18 Claims

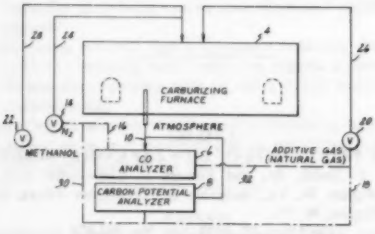
1. The method for providing elevated temperature notch strength in wrought products made of an alloy consisting essentially of about 34% to about 55% nickel, about 5% to about 25% cobalt, about 1.5% to about 5.5% columbium, about 1% to about 2% titanium, no more than 0.2% aluminum, up to about 0.1% carbon and the balance essentially iron, said columbium being replaceable by tantalum on the basis of two parts of tantalum for each part of columbium by weight, which comprises annealing said product at a temperature of about 1650° F. to about 1925° F. and then heating said annealed product in an intermediate temperature range of about 1375° F. to about 1550° F. for a time sufficient to overage said product, with the proviso that said intermediate temperature and time are upwardly graduated as the annealing temperature is increased, said temperature and time relationship being equivalent to at least 8 hours at the intermediate temperature of 1425° F. when the annealing temperature is 1900° F., and then heat treating said product in a lower temperature range of about 1100° F. to 1400° F. for at least 8 hours to provide in said product a notch strength of at least about 100 hours at 1000° F. and 100 ksi.

4,445,945

METHOD OF CONTROLLING FURNACE ATMOSPHERES

Donald J. Schwalm, Northville, Mich., assignor to Holcroft & Company, Livonia, Mich.

Continuation-in-part of Ser. No. 224,849, Jan. 14, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,727
Int. Cl.[3] C21D 1/48
U.S. Cl. 148—16 11 Claims



1. The method of maintaining a substantially stable gas analysis in the atmosphere of a furnace for controlling the carbon content of steel or cast iron to improve the effectiveness of a separate carbon potential control system, which comprises introducing into the furnace (a) a controlled mixture of methanol and nitrogen to produce a substantially neutral carrier gas atmosphere composed essentially of CO, H_2, and N_2, and (b) a minor amount of an additive gas to control the carbon potential of the atmosphere, characterized by the steps of maintaining the percentage of CO in the furnace substantially at a predetermined value without regard to the carbon potential thereof by controlling the ratio of methanol and nitrogen introduced into the furnace to form the substantially neutral carrier gas constituent of the furnace atmosphere without regard to the carbon potential of the furnace atmosphere, and controlling the carbon potential by controlling the addition of the additive gas to the furnace atmosphere.

4,445,946

HIGH STRENGTH COLD ROLLED STEEL STRIP HAVING AN EXCELLENT DEEP DRAWABILITY

Nobuyuki Takahashi; Masaaki Shibata, and Yoshikuni Furuno, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 26, 1981, Ser. No. 296,474
Claims priority, application Japan, Aug. 27, 1980, 55-117028
Int. Cl.[3] C21D 8/04; C22C 38/14, 38/28
U.S. Cl. 148—36 5 Claims

1. A high strength cold rolled, continuously annealed steel strip having an excellent deep drawability, consisting essentially of

less than 0.005% by weight of carbon;
0.5% by weight or less of silicon;
0.19% to 0.90% by weight of manganese;
0.05% to 0.12% by weight of phosphorus;
0.02% to 0.2% by weight of aluminum;
0.16% by weight or less of titanium;
and the balance of iron with unavoidable impurities, and satisfying the relationships (I) and (II):

$$\frac{\text{(Content (\%) of titanium)}}{\text{Content (\%) of carbon)}} \geqq 4 \quad \text{(I)}$$

and

$$\text{(Content (\%) of phosphorus)} \times \text{(Content (\%) of titanium)} \leqq 0.01 \quad \text{(II)},$$

and wherein

said steel strip has both a tensile strength of 35 kg/mm^2 or greater and an average plastic strain ratio r of 1.62 or greater.

4,445,947

LOW COST FLUOROCARBON FLARE COMPOSITIONS

Graham C. Shaw, III, Garland, Utah, and Russell Reed, Jr., Ridgecrest, Calif., assignors to Thiokol Corporation, Chicago, Ill.

Filed Mar. 18, 1983, Ser. No. 476,684
Int. Cl.[3] C06B 45/10
U.S. Cl. 149—19.3 15 Claims

1. An infrared flare composition comprising:

(a) from about 35 to about 60 percent by weight of a reducing agent which is magnesium, aluminum, or a mixture thereof;

(b) from about 7 to about 20 percent by weight of a free radical polymerizable solvent;

(c) an effective amount of a free radical initiator;

and

(d) from about 26 to about 60 percent by weight of a two-part fluorocarbon polymer system comprising:

(i) a high molecular weight fluorocarbon polymer, said polymer containing between about 55 and about 76 percent by weight of fluorine and having a limited solubility in the polymerizing solvent; and

(ii) a low molecular weight fluorocarbon polymer, said polymer containing between about 55 and about 76 percent by weight of fluorine and being substantially completely soluble in the polymerizing solvent.

4,445,948

POLYMER MODIFIED TNT CONTAINING EXPLOSIVES

Horace D. Stanton, and Russell Reed, Jr., both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 155,877, Jun. 2, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,495
Int. Cl.[3] C06B 45/10
U.S. Cl. 149—19.91 10 Claims

1. A melt cast explosive composition consisting essentially of trinitrotoluene, a cyclic nitramine explosive selected from the group consisting of cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine, aluminum powder, and a

polymer selected from the group consisting of ethylene vinyl acetate copolymer and an ethylene, vinyl acetate, vinyl alcohol terpolymer.

4,445,949

METHOD OF MAKING A FIBER-LOADED POLYMERIC SHEET

Gerald C. Holloway, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 7, 1981, Ser. No. 281,153
Int. Cl.³ B31D 1/00
U.S. Cl. 156—62.2 **12 Claims**

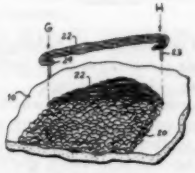
1. In a method of making a fiber-loaded polymeric sheet in a substantially continuous uninterrupted manner, said method comprising the steps of, disposing a quantity of discrete elongate fibers as a layer thereof on movable support means therefor which is movable along a rectilinear path and in a substantially horizontal plane, providing a quantity of liquid-containing polymeric material around said fibers during movement of said support means and fibers, and removing the liquid contained in said polymeric material to define said sheet, the improvement in which said disposing step comprises disposing said quantity of fibers with the longitudinal axes thereof in substantially parallel relation to each other and parallel to said rectilinear path, said providing step comprises providing said polymeric material so that it defines a substantially solid matrix for said fibers upon removing the liquid contained therein during said removing step, said disposing and providing steps comprise disposing said quantities so that following said removing step said quantity of fibers comprises between 40% and 70% of said sheet, and comprising the further step of stretching said sheet along said rectilinear path and parallel to the longitudinal axes of said fibers following said removing step to improve the parallelism of said fibers, said sheet having at least 70% of said fibers with the longitudinal axes thereof in said substantially parallel relation.

4,445,950

METHOD FOR PREPARING ARTISTIC WORKS WITH YARN

Andrea Browning, Orlando, Fla., assignor to Evelyn Thilmony, Orlando, Fla., a part interest

Filed Aug. 5, 1982, Ser. No. 405,617
Int. Cl.³ B32B 5/08
U.S. Cl. 156—63 **11 Claims**



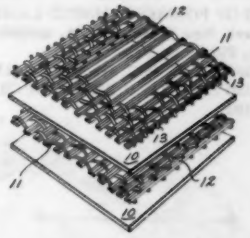
1. A method of producing artistic pictures and designs on a flat, yieldable substrate with elements of the pictures and designs formed from colored yarns comprising the steps of:
(a) doubling a first length of yarn of a selected type and color;
(b) inserting a straight pin through the yarn at the point of doubling;
(c) pressing the pin into the substrate at a selected starting point of the design;
(d) twisting the double ends of the first length of yarn;
(e) inserting a pin through the first twisted length of yarn at a point a short distance from the first pin;
(f) pinning the yarn with the second pin at a second point adjacent to the first pin to form an upward standing loop of twisted yarn;
(g) looping the twisted length of yarn back to a third point adjacent the first pin;
(h) pinning the yarn at the third point thereby forming an upward standing loop contiguous with the first upward standing loop;
(i) continuing the steps of (g) and (h) for successive points so as to completely cover a first area of the design with a first layer of contiguous upward standing loops of twisted yarn; and
(j) repeating steps (a) through (i) for each additional area of the design thereby forming a first layer of looped yarn over each area of the design.

4,445,951

METHOD OF MANUFACTURING COMPOSITE MATERIALS

David J. Lind, Breadsall, and Joyce Richards, Belper, both of England, assignors to Rolls-Royce Limited, London, England

Filed Jun. 1, 1982, Ser. No. 383,619
Claims priority, application United Kingdom, Jul. 1, 1981, 8120321
Int. Cl.³ B32B 7/08
U.S. Cl. 156—93 **7 Claims**



1. A method of manufacturing a composite material comprising the successive steps of:
(1) stitching across at least one layer of reinforcing filaments with filaments of a thermoplastic polymer so that said thermoplastic polymer filaments maintain said reinforcing filaments in a given configuration,
(2) forming a structure of said at least one layer of the thus cross-stitched reinforcing filaments and sheets of the same thermoplastic polymer as that used in filament form to cross-stitch said reinforcing filaments so that one layer of cross-stitched filaments is interposed between two sheet of said thermoplastic polymer,
(3) compressing said structure at a temperature at which said thermoplastic polymer is mobile,
(4) maintaining said compression for sufficient time and temperature for the thermoplastic polymer of the sheets and filaments to impregnate said at least one layer of reinforcing filaments,
(5) cooling the thus formed composite material under compression in order to avoid any distortion thereof, and subsequently
(6) discontinuing said compression.

4,445,952
APPARATUS AND METHOD FOR FILLING HOLES IN A CIRCUIT BOARD

Frederick W. Reynolds, III, Mission Viejo; Robert E. Miranda, Brea, and Roger C. Fabian, Van Nuys, all of Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 3, 1981, Ser. No. 317,849
Int. Cl.[1] B32B *35/00*
U.S. Cl. 156—94 **60 Claims**

1. A method of filling selected holes in a circuit board with a sealing material, comprising the steps of:

covering the circuit board with masking means including a sealing sheet and a barrier sheet having holes formed therein in alignment with the selected holes in the board to expose the selected holes in the board through the masking means, said covering step comprising covering the circuit board with the sealing sheet to prevent contact between the sealing material and undesired portions of the board, and then covering the sealing sheet with the barrier sheet to prevent significant contact between the sealing material and the sealing sheet;

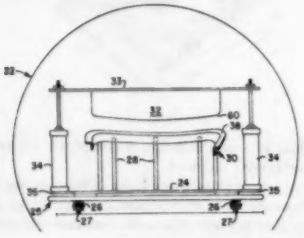
forcing the sealing material to flow through the holes in the masking means into the selected holes in the circuit board; and

stripping the masking means from the circuit board.

4,445,953
METHOD OF FORMING SHAPED LAMINATES

Thomas W. Hawk, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 25, 1982, Ser. No. 352,423
Int. Cl.[1] B32B *17/00, 31/00;* B29C *17/04;* C03B *21/00*
U.S. Cl. 156—102 **12 Claims**



1. A method of forming a transparent laminate having a desired compound or complicated configuration, comprising the steps of:

supporting a plurality of relatively flat, rigid, transparent lites and soft interlayer sheets in an overlying relation one to another to form a flat assembly, having a plurality of interfacial surfaces;

removing gases from the interfacial surfaces between said overlying lites and sheets;

laminating said evacuated overlying flat lites and sheets together to form an assembly having a deformation temperature;

positioning marginal edge portions of the flat assembly in facing relation to portions of a supporting surface of a non-planar female skeleton ring;

biasing the assembly at a first temperature below the deformation temperature of the assembly toward the supporting surface of the female skeleton ring to conform the marginal edge portions of a first major surface of the assembly to the supporting surface of the female skeleton ring to convert said flat assembly into a preliminarily shaped assembly;

heating the preliminarily shaped assembly to a second temperature at least equal to the deformation temperature of the assembly; while

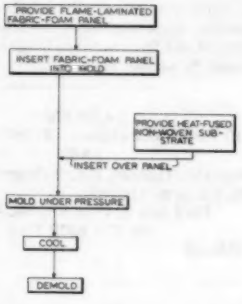
exposing the assembly to superatmospheric pressure sufficient to prevent outgassing from the sheets; and

urging a male form having a shaping surface of desired configuration toward a central portion of the second and opposite major surface of the assembly to impress the shaping surface configuration of the male form on the central portion of the assembly during said heating and elevated pressure exposing steps, thereby converting said preliminarily shaped assembly to a transparent laminate having said desired compound or complicated configuration.

4,445,954
METHOD OF MANUFACTURING MOLDED UPHOLSTERY PANELS

Ronald W. Adams, Auburn, Me.; Carl V. Leunig, Glenmont, N.Y., and Robert F. Kovar, Wrentham, Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Feb. 9, 1983, Ser. No. 465,101
Int. Cl.[1] B29C *3/00;* B32B *31/20*
U.S. Cl. 156—148 **1 Claim**



1. A method of manufacturing a padding upholstered, decorative panel having a decorative fabric surface and polymeric resin foam padding, which comprises;

(a) providing a panel base support which comprises; a core of non-woven, synthetic textile fibers; a base first layer of heat fusible, synthetic, thermoplastic textile melt fibers; a base second layer of heat fusible, synthetic, thermoplastic textile melt fibers; said first and second layers sandwiching the core, fibers of said first and second layers and the core being interengaged with each other, said interengagement being of the character obtained by needling;

(b) providing a panel intermediate layer of a synthetic, open or closed cell, thermoplastic polymeric resin foam;

(c) providing an outer, surface layer of a decorative, surface upholstery materials;

(d) assembling the intermediate layer (b) with the surface layer (c) and securing said layers (b) and (c) together;

(e) providing a mold adapted by size and configuration to receive the assembly, said mold including a means for applying heat and pressure along the peripheral edges of the assembled layers (a), (b) and (c) when the assembly is received in the mold;

(f) inserting the assembly (d) in the mold;

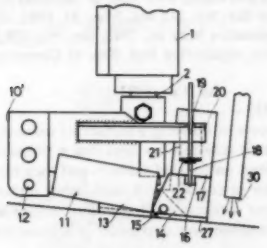
(g) heating the base support (a) to a temperature sufficient to fuse the melt fibers;
(h) inserting the heated base support (a) in the mold in a position wherein said support (a) contacts the exposed surface of the foam layer (b);
(i) applying heat and pressure on the assembly in the mold; whereby peripheral edge portions of the surface layer (c) are bonded to the base layer (a);
(j) cooling the molded panel; and
(k) demolding the molded panel.

4,445,955

WELDING OF PLASTICS MATERIAL

Friedrich Struve, Johannesburg, South Africa, assignor to Gundle Holdings (Proprietary) Limited, Edenvale, South Africa

Filed Mar. 20, 1981, Ser. No. 245,799
Claims priority, application South Africa, Mar. 4, 1981, 81/1427
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.³ B29C *27/02*; B65H *69/08*
U.S. Cl. 156—153 **14 Claims**



1. A method of welding together two adjacent sheets of flexible thermoplastic plastics material, comprising:
(a) overlapping the edges of two sheets of plastics material such that they have a pair of adjacent surface areas to be welded on either side of a common boundary line;
(b) preheating by direct contact conduction with both sheets the adjacent surface areas of both sheets to above the melting point of the thermoplastic material using a suitable heated contact member;
(c) simultaneously physically damaging the molten surface areas of both sheets to form substantially new surfaces;
(d) depositing a continuous layer of molten thermoplastic material over the preheated and damaged surfaces of both sheets; and
(e) allowing the deposited material and the material of both surfaces to solidify as a continuous phase.

4,445,956

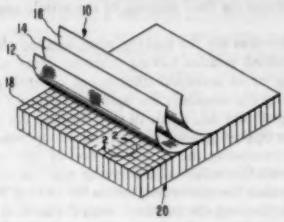
METHOD AND MATERIAL FOR SECURING STRUCTURE FOR MACHINING

Bob L. Freeman, and Peter W. Borris, both of Pleasanton, Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Feb. 14, 1983, Ser. No. 466,178
Int. Cl.³ B23P *17/00*; B32B *5/02, 7/12*
U.S. Cl. 156—154 **16 Claims**

1. A laminate for securing a structure for machining comprising: an assembly adapted to be secured to one side of the structure, said assembly including a first layer of perforate material impregnated with an adhesive, said first layer adapted to be bonded by the adhesive to one side of the structure, a second layer of fabric material bonded by the adhesive to the first layer, and a third layer of non-porous material bonded to the second layer, the structure adapted to be mounted by the assembly on a vacuum chuck for machining of the structure when the assembly is on said one side of the structure.

10. A method of securing a deformable structure to a support for handling comprising: bonding a laminate to one side of the structure with the laminate having a first layer of perforate material in engagement with the one side of the structure, a



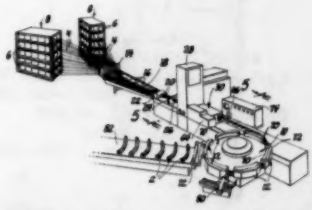
second layer of fabric material bonded by adhesive to the first layer, and a third layer of non-porous material coupled to the second layer; holding the assembly of the structure and the laminate on a support to permit processing of the structure; removing the assembly from the support; and separating the second layer from the first layer while the first layer remains bonded to said one side of the structure to stabilize the latter.

4,445,957

METHOD AND MEANS FOR MAKING CONSTANT CROSS SECTIONAL AREA PULTRUDED FIBER REINFORCED POLYMERIC ARTICLES.

Dennis L. Harvey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,240
Int. Cl.³ B32B *1/10*
U.S. Cl. 156—180 **4 Claims**



1. A method of molding an elongated, filament-reinforced, resinous, composite article having a substantially constant cross sectional area along its length but varying in width and thickness to optimize the strength characteristics of the article, the method comprising: impregnating a plurality of spaced apart elongated filaments with a liquid thermosetting resin; drawing said filaments together in substantially parallel side-by-side relationship to form an elongated coherent filament bundle in which the filaments are loosely bonded together by the liquid resin; heating the impregnated filament bundle to reduce curing time and decrease the viscosity of the resin for better wetting of the filaments; thereafter drawing the filament bundle lengthwise through a shaped die opening formed between adjacent first and second pairs of spaced apart die walls, said wall pairs being relatively movable with respect to each other, the spacing between the walls of the said first wall pair and the spacing between the walls of the said second wall pair respectively defining the thickness and width of a filament bundle drawn therethrough and the motion of the first and second wall pairs relative to each other being mechanically linked such that varying the spacing between the walls of the

wall pairs provides a said die opening of substantially constant cross sectional area; varying the said spacing between the walls of the first and second wall pairs of the die as the filament bundle is drawn therethrough such that the width and thickness of each portion of the bundle as it leaves the die substantially matches the desired width and thickness of the corresponding cross section of a compression die in which the bundle is being laid for final shaping of the article and cure of the resin.

3. A pultrusion die for making resin bonded elongated filament reinforced articles having constant cross sectional area but varying cross sectional dimensions comprising a pair of edge forming die members for defining opposite edges of the die opening of said die; a pair of side forming die members for defining the opposing side edges of the die opening of said die; means for translating the motion of one of said edge forming members with the other edge forming pair members to regulate the distance therebetween; means for linking the motion of the said side forming die members with the motion of said edge members such that as the distance between the edge forming members is increased or decreased the distance between the side forming members is decreased or increased, respectively, such that the cross sectional area of the die opening formed between the edge and side member pairs remains constant; and means for continuously advancing a bundle of reinforcement through the die.

4,445,958

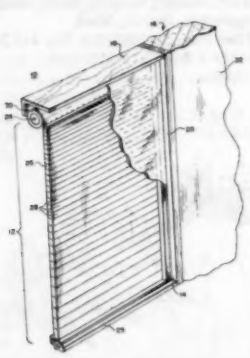
INSULATIVE STRUCTURE

Jerome F. Jaksha, 5900 Deerhaven Rd., Lincoln, Nebr. 68516

Filed Mar. 1, 1982, Ser. No. 353,849

Int. Cl.³ B31F *3/00*

U.S. Cl. 156—211 **12 Claims**



1. A method of insulating a window comprising the steps of:

cutting a flexible fabric into a substantially rectangular backing sheet having two parallel long sides and two parallel short sides with the two parallel long sides each having a different plurality of fingers of fabric extending therefrom;

cutting strips of solid stiff insulator having a length equal to said short sides and a width equal to the width of certain of said fingers of fabric;

applying an elastomeric cement between one side of each said plurality of solid insulative strips and said fabric;

fastening with said elastomeric cement said strips of solid insulator in parallel relationship to each other with their long sides adjacent to each other onto said flexible fabric with the ends of the insulators terminating at said extending fingers;

applying an adhesive to the fingers and folding them over the insulative strips, whereby each strip is held by elastomeric cement to the main body of the fabric and to the fingers;

the steps of cutting and fastening said strips of solid stiff insulators including the step of cutting insulators of different widths and fastening them in a relationship in which the smaller widths are at one end and the larger widths at the other of the flexible backing;

attaching the end of said flexible backing having the smaller width insulators to a curtain roller, whereby the fabric with insulators attached may be roller upon the curtain roller;

mounting said roller to a window;

pulling said backing strips down to form an insulator adjacent to the window; and

raising said backing and strips to permit light to pass through said window.

4,445,959

PROCESS FOR THE PRODUCTION OF SYNTHETIC RUBBER LATICES, THEIR USE AS A STARTING MATERIAL IN THE PRODUCTION OF PRESSURE-SENSITIVE ADHESIVES AND PRESSURE-SENSITIVE ADHESIVES

Rudolf Hombach; Wilfried Nolte, both of Leverkusen, Fed. Rep. of Germany; Peter J. Russell, Worchester, and Nigel G. Wall, Stourbridge, both of England, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 242,448, Mar. 11, 1981, abandoned. This application May 14, 1982, Ser. No. 378,278

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010429

Int. Cl.³ C09J *3/18*

U.S. Cl. 156—332 **5 Claims**

1. In the process of bonding a surface of one substrate to a surface of another substrate by applying a pressure-sensitive adhesive to at least one of said surfaces and then bringing said surfaces together in contact with each other under pressure, the improvement wherein said adhesive comprises a latex produced by emulsion polymerization of a monomer mixture containing

40 to 80 parts by weight of conjugated diene;

0 to 45 parts by weight of an aromatic vinyl compound;

0 to 30 parts by weight of (meth)acrylonitrile;

5 to 30 parts by weight of an acrylic acid ester containing from 4 to 8 carbon atoms in the alcohol component and

0.5 to 5.0 parts by weight of an α,β-unsaturated monocarboxylic or dicarboxylic acid,

the sum of the monomer components amounting to 100 parts by weight and from 0.5 to 2.0 parts by weight of a chain transfer agent being used per 100 parts by weight of monomer.

4,445,960

METHOD AND APPARATUS FOR MANUFACTURING OF ARTICLES FROM ONE OR SEVERAL FILM WEBS WELDED TO AND STRIPPED FROM A CONVEYOR BELT

Tage Niklasson, Lysekil, Sweden, assignor to FIAB System AB, Lysekil, Sweden

PCT No. PCT/SE81/00284, 371 Date May 28, 1982, 102(e) Date May 28, 1982, PCT Pub. No. WO82/01158, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 1, 1981, Ser. No. 387,858

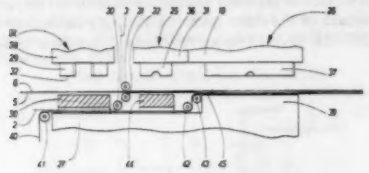
Claims priority, application Sweden, Oct. 2, 1980, 8006893

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—344 **10 Claims**

1. A method of manufacturing an article from at least one continuous film web comprising: welding said at least one film web during transportation through at least one operating station in an apparatus, said welding including welding at least two film layers against each other along at least one welding seam at a predetermined location, said at least one film web being during at least a portion of said transportation supported by a movable conveyor belt, said welding at said welding seam also welding said at least one film web against the conveyor

belt so that the film web adheres to and is releasably connected to the belt and is conveyed via a connection formed at the same



location as said at least one welding seam, and after transportation releasing said web from the conveyor belt.

4,445,961

LABELING APPARATUS FOR BOTTLES OR THE LIKE

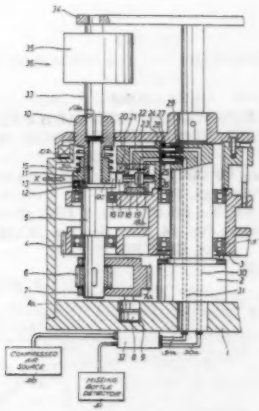
Hermann Kronseder, Donau, and Reiner Bischkopf, Neutraubling, both of Fed. Rep. of Germany, assignors to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,034

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216138

Int. Cl.[3] **B65C** *9/16, 9/42*

U.S. Cl. 156—364 **9 Claims**



9. Apparatus for labeling a series of bottles and the like including a rotating turret, a glue applicator roll, a container for labels and a label transfer member arranged about the turret in that order of rotation, and a plurality of oscillatable curved glue pallets mounted on the turret on a common circle for said pallets to be coated with glue and pick up a label and deposit said label on said transfer member if a bottle is present to receive the label and for said pallets to pass by the label container and the cylinder and glue applicator roll if a bottle is not present, comprising:

means mounting said turret for rotation about a central axis,

means for rotating the turret continuously,

a plurality of drive shafts journaled for oscillating in the turret and in parallelism with said axis, said shafts being arranged in a circular pattern equidistant from said axis,

a cam contour arranged around said axis and over most of its length varying in distance from said axis,

a gear fixed on each of said shafts and a gear segment mounted for swinging on each of said shafts, the segment on one shaft being meshed with the gear on an adjacent shaft,

cam follower means on each gear segment engaged with said cam contour and attached to the segment to oscillate the segments through an angle depending on the contour as the turret rotates to thereby oscillate the shaft having the gear,

a drive member having one planar surface and mounted for free rotation on an end portion of each drive shaft and a pallet shaft on which a said curved pallet is fixed eccentrically and which is coupled to said drive member, said drive member having a recess in its periphery,

a clutch member slidable axially on said drive member and engaged with the drive member for joint rotation,

said drive shaft having a planar surface axially adjacent said planar surface on the drive member and one of said surfaces having recesses and the other having teeth registrable in the teeth for connecting the drive shaft and clutch member in driving relation,

a pneumatic cylinder fixed to said turret and having a piston therein and a piston rod comprising a locking member adapted to be registered in said recess in the periphery of the clutch member, said cylinder having ports communicating respectively, with opposite sides of the piston,

a cylinder rotating coaxially with said turret and having openings that communicate with said ports, respectively, only when the pallet associated with said cylinder is in radially retracted position under control of said cam members,

a control valve for supplying the openings with compresses air,

a missing bottle detector responsive to a missing bottle or bottles by causing said control valve to apply pressure to said piston to engage said locking member with said clutch member to stop its rotation and thereby disengage said teeth from said recesses so the drive shaft will not oscillate said pallet shaft drive member, as the drive shaft oscillates to a limited extent and said pallet remains locked in retracted position,

said detector causing said control valve to apply pressure to said piston in a direction that will disengage said locking member when said pallet returns to the said retracted position on the next revolution if said detector detects the presence of a bottle then.

4,445,962

TIRE BUILDING DRUM

Gregory F. Felder, Stow, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 1, 1982, Ser. No. 394,203

Int. Cl.[3] **B29H** *17/16*

U.S. Cl. 156—398 **4 Claims**

1. A collapsible tire building drum comprising a support shaft having a longitudinal center line,

a plurality of circumferentially spaced arcuate drum segments spaced radially around said shaft,

power operated means mounted on said shaft and connected to said segments for expanding and contracting said drum segments, said drum segments in the expanded condition being cooperative to define a circumferentially extending cylindrical surface with two annular axially spaced edges,

an end forming ring abuttingly attached to the respective edges of said drum segments, each of said end forming rings having an off-set face portion, and each of said end forming rings having a circumferentially extending surface that tapers outwardly and upwardly away from said

cylindrical surface thence curving downwardly into said off-set face portion.

4,445,963

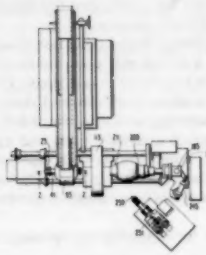
BELT-TREAD STOCK ASSEMBLY DRUM

Karl W. Klose, Findlay, and Gary H. Benjamin, Ada, both of Ohio, assignors to Cooper Tire & Rubber Company, Findlay, Ohio

Division of Ser. No. 331,263, Dec. 16, 1981, Pat. No. 4,402,782. This application Mar. 29, 1983, Ser. No. 479,932

Int. Cl.[1] B29H *17/10*; 156 *414, 417, 418, 420, 126, 427, 428*

U.S. Cl. 156—420 3 Claims



1. An expansible and contractable belt-tread stock assembly drum consisting of a rotatable supporting shaft extension having slots formed therein, a plurality of sleeve members coaxially and slidably positioned on said shaft extension, each sleeve having an enlarged stop portion formed thereon, a plurality of spider members slidably disposed on said sleeves, said spiders having a plurality of toggle members connected thereto, annular drum segments carried by said toggle members and having inwardly disposed yoke members, an annular disc member carried by said shaft extension intermediate said sleeve members, said annular disc member having radially extended slots arranged about its outer circumference, block members slidably disposed in said slots and being attached to said yoke members, a plurality of air cylinders secured to said annular disc member and having piston rods connected to said spiders for axial manipulation of said spiders, a threaded rod coaxially disposed within said shaft extension and having a portion thereof protruding from an end of said shaft extension, said rod portion being supported by a bearing assembly carried by said shaft extension, said bearing permitting rotation of said rod while preventing axial displacement of said rod with respect to said shaft extension, said rod having threaded end portions of opposite pitch, nut members positioned on said threaded rod portions, key members rigedly attached to each of said nut members and projecting through said slots in said shaft extension and engaging said sleeve members stop portion to limit the axial movement of said spiders on said sleeves upon the rotation of said threaded rod.

4,445,964

APPARATUS FOR MANUFACTURING A STRING CONSTRUCTION

Masaaki Nakamura, and Hisaaki Ueba, both of Tochigi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi and Kureha Gosen Kabushiki Kaisha, Mibu, both of, Japan

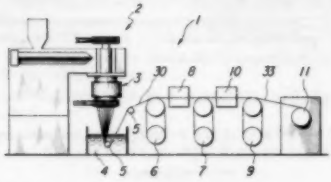
Division of Ser. No. 205,902, Nov. 12, 1980, abandoned. This application Nov. 29, 1982, Ser. No. 444,883

Claims priority, application Japan, Nov. 16, 1979, 54-147652; Oct. 15, 1980, 55-144136

Int. Cl.[1] B29D *23/04*

U.S. Cl. 156—500 10 Claims

1. An apparatus for manufacturing a string having an extruding device comprising a main body, an outer spinneret rotatably mounted on the main body, an inner spinneret rotatably mounted on the outer spinneret and driving means for rotating at least one of the outer spinneret and the inner spinneret around the axis of the spinnerets as a center, the outer circumferential surface of the inner spinneret and the inner circumferential surface of the outer spinneret slidingly contacting each other and each having respectively formed therein at least one



groove for extruding thread-like molten resin streams, the inner spinneret being provided with a through hole and with a recess communicating with the through hole, a single thread-like molten resin stream being extruded from the recess, and the groove and the through hole communicating with a passage for supplying the molten resin thereto.

4,445,965

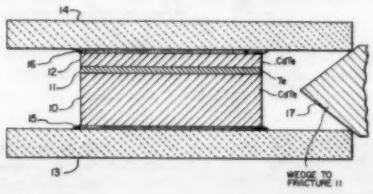
METHOD FOR MAKING THIN FILM CADMIUM TELLURIDE AND RELATED SEMICONDUCTORS FOR SOLAR CELLS

Arthur G. Milnes, Pittsburgh, Pa., assignor to Carnegie-Mellon University, Pittsburgh, Pa.

Continuation of Ser. No. 215,079, Dec. 1, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 387,961

Int. Cl.[1] C30B *19/12*

U.S. Cl. 156—624 19 Claims



1. A method of producing a desired first thin semiconductor film for use in solar cells comprising:

(a) growing epitaxially a second semiconductor film on a third semiconductor the second semiconductor film having a lower fracture strength than the desired semiconductor film and the second semiconductor having a substantial lattice match with the desired semiconductor;

(b) growing epitaxially the desired semiconductor film on the second semiconductor film so that the second semiconductor film orients the desired semiconductor film;

(c) affixing a rigid substrate to the under surface of the third semiconductor and a rigid superstrate to the upper surface of the desired semiconductor film;

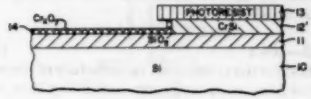
(d) applying stress to the rigid superstrate and rigid substrate so as to fracture the said second semiconductor film; and

(e) detaching the desired semiconductor film.

4,445,966
METHOD OF PLASMA ETCHING OF FILMS CONTAINING CHROMIUM

Robert J. Carlson, Brooklyn Park, and Daniel W. Youngner, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 20, 1983, Ser. No. 505,624
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 22 Claims



1. A method of etching a film containing chromium and silicon in an etching chamber, said method comprising:

preheating said film;

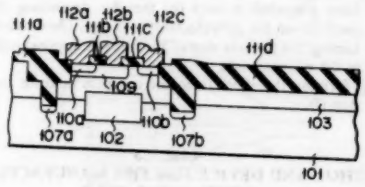
filling said etching chamber with an etchant gas including fluorine and oxygen while said film is contained therein; and

providing a radio frequency electrical excitation to said etchant gas.

4,445,967
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Shuichi Kameyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1982, Ser. No. 423,092
Claims priority, application Japan, Feb. 3, 1982, 57-14853
Int. Cl.³ H01L 21/306, 21/312; B44C 1/22; C03C 15/00
U.S. Cl. 156—648 13 Claims



1. A method for manufacturing a semiconductor device, comprising the steps of:

forming a mask material pattern at least on a portion of a semiconductor layer which corresponds to a prospective element formation region;

etching said semiconductor layer, using said mask material pattern, to form a first groove which is wide and shallow;

burying a first isolating material in said first groove to a thickness substantially equal to the depth of said first groove;

etching a portion of said first isolating material film which is located in the vicinity of said prospective element formation region to partially expose a bottom of said first groove, thereby forming a second groove which is narrower than said first groove, a position of said second groove being defined by said mask material pattern;

forming a third groove which is deeper than said first and second grooves etching a bottom of said second groove; and

burying a second isolating material in said third groove.

4,445,968
SURFACE TREATMENT FOR CERAMICS TO ELIMINATE ALPHA PARTICLE EMITTING ELEMENTS

Herman S. Hoffman, Milton, and Robert T. Howard, Jr., Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

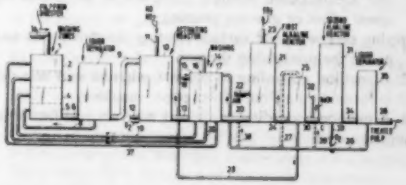
Filed Jul. 14, 1983, Ser. No. 513,580
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—657 9 Claims

1. A method of reducing alpha particle emissions from a ceramic packaging material, wherein said ceramic material includes particles of metallic oxides bonded together by a siliceous material, and wherein alpha particle emitters are contained in said siliceous material, which method comprises removing from a surface layer of said ceramic material a predetermined amount of said siliceous material and thereby removing said alpha particle emitters contained therein.

4,445,969
PROCESS FOR THE DELIGNIFYING BLEACHING OF CELLULOSE PULP BY ACTIVATING THE PULP WITH NO_2 AND OXYGEN

Hans O. Samuelson, Gothenburg, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Dec. 16, 1982, Ser. No. 449,889
Claims priority, application Sweden, Dec. 30, 1981, 8107858
Int. Cl.³ D21C 1/04, 3/16, 9/10
U.S. Cl. 162—40 20 Claims



1. A process for delignifying bleaching lignin-containing cellulose pulp which comprises:

(1) activating cellulose pulp by reacting the pulp with a gas comprising NO_2 and oxygen in the presence of water at a temperature within the range from about 30° to about 120° C. while so controlling the amount of nitrogen oxides, the pulp consistency, the temperature, and the residence time so that the reduction in intrinsic viscosity of the pulp at the end of this stage is limited to within the range from 2 to 35% less than at the beginning of the stage;

(2) washing the activated pulp with water or an aqueous solution;

(3) treating the activated washed pulp with an aqueous alkaline solution comprising an alkaline carbonate of which a major proportion is in the form of HCO_3^- at a temperature within the range from about 90° to about 170° C., in the presence of oxygen gas at an average oxygen partial pressure within the range from 0.001 to about 0.2 MPa, until the lignin content of the pulp is so reduced that the Kappa number of the pulp is within the range from about 10 to about 60% of the Kappa number of the pulp entering the activating stage (1), and releasing carbon dioxide gas liberated;

(4) treating the activated washed pulp from step (3) with an aqueous alkaline solution comprising an alkaline carbonate of which a major proportion is in the form of CO_3^{--} at a temperature within the range from about 90° to about 170° C., in the presence of oxygen gas at an average oxygen partial pressure within the range from about 0.1 to about 3 MPa;

(5) withdrawing from stage (4) alkaline liquor comprising HCO_3^- and recycling said liquor to stage (3) as a source of HCO_3^-.

4,445,970

HIGH MINERAL COMPOSITE FINE PAPER

Richard L. Post, Ridgway, and Robert G. Fort, St. Marys, both of Pa., assignors to Penntech Papers, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 199,165, Oct. 22, 1980, abandoned. This application Jun. 1, 1981, Ser. No. 267,941

Int. Cl.[3] D21F *11/00*

U.S. Cl. 162—135 28 Claims

1. A method of manufacturing fine paper containing mineral filler at a high speed comprising:

preparing an acidic paper furnish including paper-making fibers; an amount sufficient of mineral filler to retain internally in the fine paper web formed of 30–70% mineral filler, and wherein said mineral filler is system compatible; at least one retention aid agent which comprises a water soluble cationic polymer; and 3–7%, based on the dry furnish, of a cationic latex or amphoteric latex which is cationic at acid pH, said cationic or amphoteric latex being selected from latices which provide good mineral filler retention without substantial reduction in strength, which have a charge opposite to and less than the sum of the charges of the other ingredients of said furnish, and which precipitate on the fibers and fillers to exhaustion or near exhaustion;

forming a wet paper web from said furnish such as to produce fine paper of thickness 1.5–15 mils and weight 30–150 lbs/3300 ft^2 containing internally greater than 30% mineral filler up to 70% mineral filler, and having tensile and Z-directional strength sufficient to withstand high-speed offset or gravure printing;

drying said web; and surface treating the dried web to improve the printability thereof.

2. A method according to claim 1 wherein said wet paper web is formed on a Fourdrinier paper machine.

3. A method according to claim 1 wherein said furnish also comprises alum.

4,445,971

METHODS OF FOAM INHIBITION OR DEPRESSION

Susan C. Lappi, Lakeville, and James E. Maloney, Eagan, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation of Ser. No. 162,315, Jun. 23, 1980, abandoned. This application May 19, 1982, Ser. No. 379,582

Int. Cl.[3] D21H *3/02*

U.S. Cl. 162—158 28 Claims

1. A process for inhibiting foam in an aqueous liquid having a tendency to do so, the process comprising the step of adding to the liquid a defoamer in an amount effective to reduce or eliminate foam, the defoamer consisting essentially of polyether chain consisting essentially of polyethylene oxide block or chain comprising an average of about 9.5 to 12.5 moles of ethylene oxide, the polyethylene oxide chain having attached on one end thereof poly 1,2-propylene oxide block or chain comprising 20 to 50 moles 1,2-propylene oxide, the propylene oxide chain being hydroxyl-terminated, the remaining end of the polyethylene oxide chain being attached to an alkylphenol hydrophobe, wherein the ratio of moles of ethylene oxide to moles of 1,2-propylene oxide is no greater than about 0.42:1.

4,445,972

PROCESS FOR THE CONTINUOUS MANUFACTURE IN AN AQUEOUS MEDIUM OF SHEETS MADE OF FIBROUS MATERIAL AND CONTAINING LATEX OR SIMILAR AND/OR PHENOPLASTS OR AMINOPLASTS, SHEETS OBTAINED BY SAID PROCESS AND THEIR POSSIBLE RE-USE

René Bartelloni, Lisle en Rigault, France, assignor to Papeteries de Jean d'Heurs, Bar le Duc, France

Filed Feb. 16, 1982, Ser. No. 349,366

Claims priority, application France, May 12, 1981, 81 09400; Jan. 8, 1982, 82 00224

Int. Cl.[3] D21H *3/32*

U.S. Cl. 162—164.1 12 Claims

1. A method for the continuous manufacture of fibrous paper sheet material from an aqueous pulp containing latex, comprising:

(a) providing an aqueous suspension of fibers having an anionic charge,

(b) providing an aqueous suspension of finely divided latex particles, having an anionic charge stabilized at a pH between 4 and about 5, the amount of latex in the dry state being between 3 and 75% with respect to the total weight of fibrous material, the diameter of the latex particles being between 0.01 and 0.5 microns;

(c) adding to the aqueous suspension of fibers prepared in step (a), a polyelectrolyte having a molecular weight greater than 15,000, and a cationic charge, said polyelectrolyte being used in the form of a solution containing between 0.2 and 10% by weight of polyelectrolyte and the amount of polyelectrolyte added to the aqueous suspension of fibers being between 0.1 and 3.5% with respect to the total dry weight of the latex, to be added later,

(d) avoiding the presence in the aqueous medium of substantial amounts of ions which will cause cleavage of bonds created by the polyelectrolyte between the latex particles and the fibers, said ions including chloride ions, sulfate ions and sulfamate ions,

(e) adjusting the pH of the obtained mixture to a value between 4 and 5.5,

(f) adding to the obtained mixture the aqueous suspension of latex prepared in step (b) thereby depositing the latex particles on the polyelectrolyte coated fibers while maintaining the particle size of the latex at approximately 0.01 to 0.5 microns, and

(g) forming the sheet from the aqueous mixture formed in step (f).

4,445,973

METHOD AND DEVICE FOR THE MANUFACTURE OF MECHANICAL PULP

Hjalmar S. I. Bystedt, Enebyberg, Sweden, assignor to Sunds Defibrator AB, Stockholm, Sweden

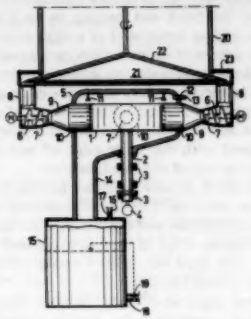
Division of Ser. No. 195,708, Oct. 9, 1980, Pat. No. 4,406,734. This application Sep. 29, 1982, Ser. No. 428,082

Int. Cl.[3] D21B *1/14*

U.S. Cl. 162—261 2 Claims

1. An apparatus for producing mechanical pulp in which chips of lignocellulosic material are ground in the presence of moisture while being forcibly retained against the circumferential surface of a grinding disc which rotates about an axis perpendicular to the opposite end faces of said grinding disc within means defining a pressurized housing having an inlet for the chips, steam inlet means for pressurizing said housing and outlet means for discharging the ground material from said housing, said apparatus being characterized by passage means for advancing said chips into continuous forced contact with one or more grinding areas located on said circumferential surface, said passage means comprising a portion tapering in the direction of advancement of the chips and means for advancing and compressing said chips in said tapering portion into a substantially steam-tight plug while being advanced therein, an outwardly flared portion for receiving said plug

and allowing it to expand therein while being further advanced, and a cylindrical portion for receiving said expanded



plug and advancing the resultant cylindrical plug into contact with said grinding areas.

4,445,974

APPARATUS FOR FORMING A MULTILAYER JET OF PAPER MAKING STOCK

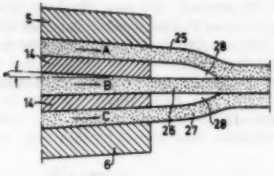
Erik G. Stenberg, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Continuation-in-part of Ser. No. 210,781, Nov. 26, 1980, abandoned, which is a continuation of Ser. No. 31,409, Apr. 19, 1979, abandoned. This application May 22, 1981, Ser. No. 266,174

Claims priority, application Sweden, Apr. 25, 1978, 7804729

Int. Cl.³ D21F *1/06*

U.S. Cl. 162—300 **28 Claims**



1. A multilayer headbox for delivering a stratified sheet-like jet to a forming surface of a paper making machine comprising spaced apart headbox walls defining an elongated, converging channel terminating in an exit opening, at least one partition member anchored in the headbox at its upstream end with its downstream end free and extending at least to the vicinity of said opening, said partition member extending from side to side in said channel and dividing the headbox into a plurality of shallow, converging channels extending to said opening for conveying a plurality of paper making stocks thereto and discharging a plurality of sheet-like jets of paper making stocks therefrom, in which the improvement comprises at least one partition member having a downstream end formed so that the jets of paper making stock are discharged from said opening in stacked, spaced apart relation, with a gap therebetween, together with means for maintaining a wedge-shaped body of gaseous fluid in the gap between said discharged jets of paper making stock at the downstream end of said partition member to keep the jets separated for a predetermined distance beyond said opening in the direction of said forming surface.

4,445,975

HEADBOX FOR A PAPERMAKING MACHINE

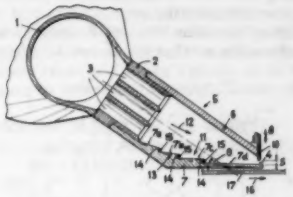
Rüdiger Kurtz, Immenstaad, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,676

Claims priority, application Switzerland, Nov. 26, 1980, 8744/80

Int. Cl.³ D21F *1/02*

U.S. Cl. 162—336 **7 Claims**



1. A headbox for a papermaking machine comprising:

a nozzle channel through which flows a stock suspension;

said nozzle channel having an outlet slice and converging in the direction of said outlet slice;

said nozzle channel being bounded by two lip members;

said two lip members extending in a primary flow direction of the stock suspension and each terminating substantially at the region of said outlet slice;

one of said lip members having a plurality of step portions at an inner surface thereof which extends substantially transversely with respect to said primary flow direction of the stock suspension;

each said step portion comprising an essentially flat partial surface of the inner surface of said lip member and an end surface disposed substantially transversely with respect to the primary flow direction of the stock suspension;

each said flat partial surface extending substantially in a lengthwise direction essentially in the primary flow direction of the stock suspension;

each said step portion being arranged at a portion of the inner surface of said lip member which is substantially concave with respect to the stock suspension;

said step portions producing turbulence at a boundary flow region of the stock suspension flowing along the step portions and at least partial detachment thereof at the region of said concave portion in order to substantially annihilate secondary flow of the stock suspension at the region of said concave portion caused by centrifugal forces effective at the stock suspension, in order to thus essentially preclude the formation of turbulence threads and thus streaking of a formed paper web;

said concave portion defining part of a flow path of the stock suspension which extends in a substantially curved configuration with respect to the primary flow direction of the stock suspension; and

a corner of said step portion being located essentially at the region of the flow path of the stock suspension which extends in said curved configuration with respect to the primary flow direction of the stock suspension.

4,445,976

METHOD OF ENTRAINED FLOW DRYING

Christopher LaDelfa, Calabasas Park, and John F. Nutter, Encino, both of Calif., assignors to Tosco Corporation, Santa Monica, Calif.

Filed Oct. 13, 1981, Ser. No. 310,650

Int. Cl.³ C10B *57/08, 57/10*

U.S. Cl. 201—41 **17 Claims**

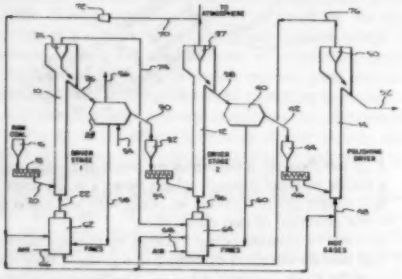
1. In a process for staged drying of moist particulate carbonaceous material wherein said carbonaceous material is en-

trained in a plurality of serially connected hot gas streams having temperatures above the devolatilization temperature of said carbonaceous material, said carbonaceous material while in said gas streams forming a solids blend of smaller relatively hot and dry particles and larger relatively cool and moist particles, wherein the improvement comprises:

entraining said solids blend within each said hot gas stream for a time sufficient to heat said smaller particles to a temperature below the devolatilization temperature of said carbonaceous material;

separating the solids blend from said gas stream and any moisture contained therein;

transferring the solids blend to a contactor zone prior to transfer to the next hot serially connected gas stream; and



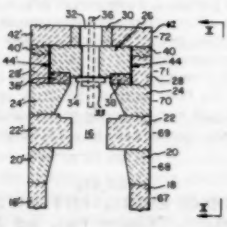
contacting said relatively hot smaller particles with said relatively cool larger particles for a sufficient amount of time to allow heat transfer from said smaller particles to said larger particles whereby said smaller particles are partially cooled and said larger particles are partially heated such that said smaller and larger particles obtain a final temperature within the contactor zone which is below the temperature of the smaller particles at the time the smaller particles enter the contactor zone to thereby prevent overheating and devolatilization of said smaller particles when the solids blend is passed to said next serially connected hot gas steam.

4,445,977

COKE OVEN HAVING AN OFFSET EXPANSION JOINT AND METHOD OF INSTALLATION THEREOF

Lee K. Husher, Bethel Park, Pa., assignor to Furnco Construction Corporation, Carnegie, Pa.

Filed Feb. 28, 1983, Ser. No. 470,610
Int. Cl.³ C10B *29/02, 29/04, 29/06*
U.S. Cl. 202—223 **5 Claims**



1. In a coke oven having brickwork in the horizontal flue area of a horizontal flue chamber which is subject to thermal expansion wherein the bricks forming the brickwork are arranged in tiers and the top of the flue chamber is defined by a fixed tier of brick at a fixed elevation relative to the roof of the oven, the improvement in an expansion joint for preventing the leakage of gas from the oven chamber into the flue chamber comprising:

A. brick in a lower tier of brickwork below and spaced from said fixed tier brick and forming an inner wall of the flue chamber and an outer wall of a coke oven chamber;

B. a first segment of ceramic fiber positioned on said lower tier brick and within the space between the fixed tier brick and the lower tier brick, the inner edge of said segment being generally aligned with the inner edge of the lower tier brick and the outer edge of said segment being generally aligned with the outer edge of said fixed tier brick forming the top of the flue chamber;

C. an outer brick in said fixed tier having an outer edge in alignment with and forming a portion of the wall of the coke oven chamber and having an inner edge in abutment with the outer edge of said first segment and the outer edge of said fixed tier brick forming the top of the flue chamber in said fixed tier;

D. a second segment of ceramic fiber positioned on said outer brick in said fixed tier, the inner edge of said second segment in abutment with the outer edge of said fixed tier brick and the outer edge of said second segment being aligned with and forming a portion of the wall of the coke oven chamber;

E. brick in an upper tier above said fixed tier brick positioned on said fixed tier brick and said second segment, the outer edge of said upper tier brick forming a portion of the coke oven wall;

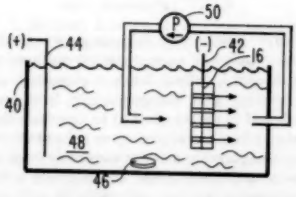
F. said first and second segments being offset from one another laterally and a common barrier composed of silica mortar extending along the outer edge of said first segment, the inner edge of said second segment, the outer edge of said fixed tier brick and the inner edge of said outer brick in said fixed tier to form a slip joint and said mortar being characterized by its ability, upon exposure to a temperature of about 2200° F. for sufficient time, to set up to prevent leakage of gas through said brickwork in the area of said expansion joint.

4,445,978

METHOD FOR FABRICATING VIA CONNECTORS THROUGH SEMICONDUCTOR WAFERS

James C. Whartenby, Trenton; Richard Brown, Berkeley Heights; Srinivas T. Rao, Kendall Park, all of N.J., and Raymond J. Menna, Jenkintown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,551
Int. Cl.³ C25D *5/02, 7/04*
U.S. Cl. 204—15 **10 Claims**



1. A method for fabricating a via connector in a semiconductor wafer from a first surface of the wafer and extending to a second surface of the wafer which is opposite the first surface said method comprising the ordered steps of:

(a) forming an adherent metallic layer on the first surface of the wafer

(b) laser drilling an aperture through said metal layer and then through the wafer from the first surface to the second surface

(c) applying a layer of a photoresist over said metal layer

(d) exposing and developing the photoresist provide a pas-

sage through the layer of photoresist which is in axial alignment with the aperture.

(e) electrically connecting the metal layer to the cathode of an electroforming apparatus

(f) immersing the wafer in an electrolyte held by the electroforming apparatus; and

(g) electroforming a metallic via connector within said aperture extending from the first surface to the second surface of said wafer.

4,445,979

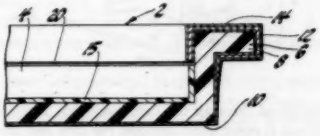
METHOD OF FORMING COMPOSITE SURFACE ON A DIELECTRIC SUBSTRATE

Joseph P. Lutfy, Highland; Thaddeus J. Grabowski, Taylor, and Robert G. Arnold, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1983, Ser. No. 520,477

Int. Cl.³ C25D *5/02, 5/56*

U.S. Cl. 204—15 **6 Claims**



1. A process for providing a dielectric substrate with a composite surface including a metal plated portion adjacent an unplated portion comprising the steps of:

(a) depositing a substantially continuous metallic film atop said substrate;

(b) removing a narrow band of said film so as to expose a correspondingly narrow strip of said substrate, said strip defining a first zone of said film which is substantially coextensive with said plated portion and serving to electrically isolate said first zone from a second zone of said film which is substantially coextensive with said unplated portion;

(c) immersing said zones in a metal electroplating bath which is capable of dissolving said film;

(d) cathodizing said first zone in said bath in such manner as to commence electrolytic deposition of at least part of said metal plated portion thereon before any significant dissolution of said first zone occurs; and

(e) concurrently with said cathodizing, dissolving said second zone in said bath to expose said substrate on said surface.

4,445,980

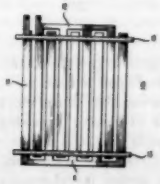
COPPER ELECTROPLATING PROCEDURE

Craig G. Smith, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1983, Ser. No. 526,480

Int. Cl.³ C25D *5/02, 3/38, 17/00*

U.S. Cl. 204—15 **11 Claims**



1. A process for electroplating copper using periodic reversing of the electroplating current comprising the step of passing current through a cathode, electroplating solution and nonconsumable dual anode system using a source of current which is periodically reversed in direction from a plating mode to a deplating mode characterized in that the nonconsumable dual anode system comprises metal-oxide anode which is electrically connected to the source of current during the plating mode and chemically inert anode which is connected to the source of current during the deplating mode.

4,445,981

METHOD OF FORMING COLORED PATTERN ON THE SURFACE OF ALUMINUM OR ALUMINUM ALLOY

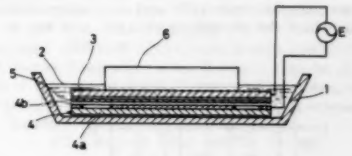
Tetsuro Ishii; Tadanori Oyama; Masashi Yamashita; Kazuyuki Kzome; Tsutomu Ikeda, and Satoru Fujioka, all of Kagawa, Japan, assignors to Nihon Koki Kabushiki Kaisha, Kagawa, Japan

Filed Nov. 30, 1982, Ser. No. 445,633

Claims priority, application Japan, May 20, 1982, 57-87028

Int. Cl.³ C25D *5/02, 5/34*

U.S. Cl. 204—18.1 **9 Claims**



1. A method of forming a colored pattern on the surface of aluminum or aluminum alloy comprising the steps of: subjecting said surface to a first electrolytic treatment to form a background of anodic oxide film; placing a pattern-forming electrode against said surface in adjacent but spaced apart relation, and subjecting said surface to a second electrolytic treatment to electrochemically impress said pattern onto said background by applying a voltage between said surface and said pattern-forming electrode in an electrolytic bath containing a metallic salt, said bath containing a metallic salt being capable of electrochemically depositing color-forming particles such that said color-forming particles are deposited by said second electrolytic treatment; removing said pattern-forming electrode from said surface; and subjecting said surface having said background and said pattern to a third electrolytic treatment in an electrolytic bath containing a metallic salt also capable of electrochemically depositing colorforming particles thereby developing differences in color tones and intensities between said background and said pattern.

4,445,982

PROCESS FOR PRODUCING A DESIGN COMPOSED OF TWO DIFFERENT MATERIALS ON THE SURFACE OF AN OBJECT

Michel E. Royer, La Balme de Sillingy, France, assignor to S. T. Dupont, Paris, France

Filed Feb. 4, 1983, Ser. No. 463,770

Claims priority, application France, Feb. 8, 1982, 82 01992

Int. Cl.³ C25O *5/02*

U.S. Cl. 204—18.1 **6 Claims**

1. A process for producing on an object made of a base material a decoration including at least two different materials, said process including at least one cycle comprising the steps of:

applying a removable masking material to at least one region of the outer surface of said object;

simultaneously machining said masking material and said underlying base material over at least a portion of said region;

coating the machined portion of said underlying base mate-

rial with a second material differing from said base material; and

substantially completely removing said masking material.

4,445,983

SEALING ANODICALLY PRODUCED OXIDE LAYERS, ON ALUMINUM

Hans J. Gohausen, Langenfeld; Winfried Kirchhoff, Duesseldorf; Jurgen Lindener, Monheim, and Harald Wennemann, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

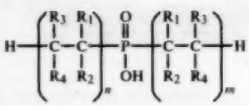
Filed Aug. 30, 1983, Ser. No. 527,906

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233411

Int. Cl.³ C25D *11/18*

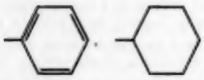
U.S. Cl. 204—35 N **15 Claims**

1. A process for sealing an anodically produced oxide layer on aluminum or an aluminum alloy comprising treating said anodically produced oxide layer with an aqueous solution at a temperature between about 90° C. and the boiling point thereof, wherein said aqueous solution has a pH of from about 4 to about 8 and contains from about 0.0005 to about 0.5 g/l of at least one phosphinocarboxylic acid or a water-soluble salt thereof in which the phosphinocarboxylic acid has the formula:



(I)

wherein n and m can be the same or different and are integers of from 0 to 8, provided that n+m=1 to 8; R_1 is hydrogen or one of the groups $-CH_3$, $-C_2H_5$, $-C_3H_7$, $-C_4H_9$,



—COOH, $-CH_2-COOH$, $-CH_2-CH_2-COOH$, or —CH(COOH)—CH_2—COOH, and R_2, R_3 and R_4 can be the same or different and are each hydrogen or one of the groups $-CH_3$, $-C_2H_5$, —COOH, $-CH_2-COOH$, or $-CH_2-CH_2-COOH$; and wherein at least one of the groups R_1 to R_4 is a —COOH group or is a group that contains a —COOH group.

4,445,984

PARASITIC ELECTRODIALYSIS RECOVERY OF DISSOLVED CHEMICALS FROM DILUTE SOLUTIONS DIRECTLY INTO A PLATING BATH

Richard P. Tison, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1982, Ser. No. 390,231

Int. Cl.³ C25D *3/12*; C02F *1/46*; B01D *13/02*

U.S. Cl. 204—49 **3 Claims**

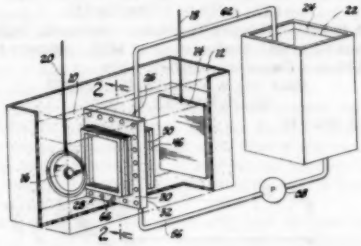
3. A method for electroplating a metal onto a workpiece temporarily immersed in an aqueous electroplating bath and concurrently recovering dissolved ionic electroplating chemicals from contaminated rinse water used to wash residual electroplating solution from prior plated workpieces, said electroplating bath having dissolved therein a platable metal cation and a related anion, said method comprising

immersing a workpiece into the electroplating bath spaced apart from an immersed anode,

immersing an electrodialysis recovery unit within the bath between the anode and the workpiece, said unit being defined by a first cathode-facing membrane selectively permeable to cations including said platable metal cation, but not to anions, and a second anode-facing membrane selectively permeable to anions, but not cations, said first and second membranes having outer bath-contacting surfaces, said unit being immersed such that a continuous path is formed between the anode and the cathode about the unit,

flowing contaminated rinse water into the unit so as to contact the inner surfaces of the membranes,

cathodically biasing the immersed workpiece with respect to the anode to electroplate the metal from the bath onto the workpiece, said biasing resulting in an electrical current



conducted through the bath such that a relatively minor portion is conducted through the unit and causes cations and anions in the rinse water to migrate through the cation-permeable and anion-permeable membranes, respectively, and to be recovered into the bath, said current through the unit combining with current conducted through the bath about the unit to produce a dense, high quality electroplate on the workpiece,

removing the electroplated workpiece from the bath, and

withdrawing purified water from the electrodialysis recovery unit.

4,445,985

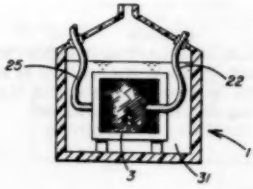
ELECTRO ORGANIC METHOD AND APPARATUS FOR CARRYING OUT SAME

Malcolm Korach, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 478,930

Int. Cl.³ C25B *3/02, 3/04*

U.S. Cl. 204—72 **2 Claims**



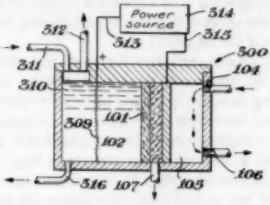
1. In a method of reacting an organic reactant at an electrode of an anode-cathode electrode pair to form an organic product, comprising contacting one member of the electrode pair with the organic reactant and externally imposing an electrical potential across the electrode pair, the improvement wherein both electrodes of said electrode pair are in contact with gelled solid polymer electrolyte means therebetween, said organic reactant is gaseous, and water vapor is fed with the gaseous reactant whereby to maintain water of hydration within the solid polymer electrolyte.

4,445,986

ELECTROCHEMICAL CELL HAVING A SEPARATOR-GAS ELECTRODE COMBINATION

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 3, 1982, Ser. No. 404,688
Int. Cl.³ C25B 1/16, 1/26
U.S. Cl. 204—98 12 Claims



7. An electrochemical cell comprising:

(a) a first compartment adapted to contain a liquid electrolyte;

(b) a first electrode positioned in the first compartment;

(c) a separator adapted to permit the flow of fluids or ions therethrough and having at least a first and a second face wherein the second face of the separator is at least partially contiguous to the first compartment;

(d) a hydraulically permeable gas electrode adapted to permit a liquid and a gas to enter and exit the gas electrode and having at least a first and a second face;

(e) a self-draining member having a fluid outlet and at least two faces, at least a portion of a first face of the self-draining member being contiguous to at least a portion of a first face of the separator, and at least a portion of a second face of the self-draining member being contiguous to at least a portion of the first face of the gas electrode; said self-draining member having a plurality of interconnected passageways in fluid-transferring communication with the separator, the gas electrode and the fluid outlet and providing the major conduit therebetween;

(f) a gas chamber contiguous to at least a portion of the second face of the gas electrode.

4,445,987

ELECTROLYTIC PURIFICATION AND RECONCENTRATION OF WASH AND RINSE CAUSTIC SOLUTIONS RECOVERED FROM THE REGENERATION OF ION EXCHANGE RESINS

Enrico Benedetto, Domodossola, Italy, assignor to Oronzio de Nora S.A., Lugano, Switzerland

Filed Mar. 30, 1983, Ser. No. 480,618
Int. Cl.³ C25B 1/16, 1/00; C02F 1/46
U.S. Cl. 204—98 11 Claims

1. An electrolytic process for the purification of contaminated caustic solutions which comprises feeding the contaminated caustic solution to the anodic composition of an electrolysis cell separated from the cathodic compartment by a cation exchange membrane; feeding demineralized water to said cathodic compartment; recovering purified caustic solution from said cathodic compartment; conducting the electrolysis at a current density between 1500 and 3000 ampere per square meter until the caustic concentration in the anolyte is reduced to a value not lower than 10 grams per liter; and conducting the electrolysis at a current density between 1000 and 500 ampere per square meter to further reduce the caustic concentration in the anolyte to below 2 grams per liter while maintaining the caustic concentration constant in the catholyte by regulating the rate of feeding of the demineralized water to said cathode compartment.

4,445,988

MICROGRAPHIC DETECTION OF PLASTIC DEFORMATION IN NICKEL BASE ALLOYS

Arthur F. Steeves, Schenectady, and Albert E. Bibb, Clifton Park, both of N.Y., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Sep. 29, 1980, Ser. No. 426,448
Int. Cl.³ C25D 5/38; G01N 27/61
U.S. Cl. 204—129.2 6 Claims

1. A method of detecting low level plastic deformation in a metal alloy article consisting essentially of:

(a) polishing the surface of said article to obtain a substantially flow free surface;

(b) electrolytically etching said surface with nital at a current density of less than 0.1 amp/cm^2; and

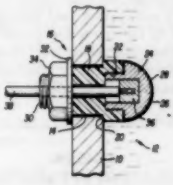
(c) microscopically examining said surface by interference contrast illumination to determine the presence of alternating striations, the presence of said striation indicating plastic deformation in said article.

4,445,989

CERAMIC ANODES FOR CORROSION PROTECTION

Ashok Kumar, Champaign; Ellen G. Segan; John M. Bukowski, both of Urbana, and Jon L. Helgeland, Champaign, all of Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 11, 1982, Ser. No. 407,189
Int. Cl.³ C23F 13/00
U.S. Cl. 204—147 7 Claims



1. An anode useful in corrosion protection of a metal structure wherein an electric current is passed between the anode and the metal structure, said anode comprising a metallic substrate having an applied layer thereon from which layer the current will flow from said anode, said layer being formed from lithium ferrite, and said layer having metallic electronic conductivity and a thickness of at least about 8 mils.

4,445,990

ELECTROLYTIC REACTOR FOR CLEANING WASTEWATER

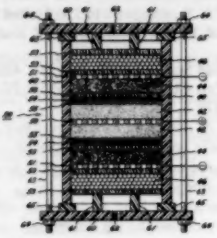
Bang M. Kim, and Joseph L. Weininger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,252
Int. Cl.³ C02F 1/46
U.S. Cl. 204—151 5 Claims

1. A method for treating metal plating operation waste water, especially to remove metal and to break down toxic organics, chelating agents and cyanide, said method comprising the step of:

passing the waste water through a cathode and an anode of an electrochemical cell, from cathode to anode, said cathode comprising a porous, flow-through felt mass of conductive carbon fibers and said anode being a flow-through

anode comprising material selected from the group consisting of porous carbon, carbon fibers, and metal oxides,



said anode and cathode being separated by a porous nonconductive spacer.

4,445,991

ENHANCED WETTABILITY OF ORGANIC SURFACES

Harold A. Arbit, Highland Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,651

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ C07C *3/24*

U.S. Cl. 204—168 **4 Claims**

1. A method for enhancing the wettability of an organic surface which is at least comparatively hydrophobic comprising subjecting said surface to a plasma surface treatment using a gaseous medium selected from the group consisting of oxygen, argon, nitrous oxide, air and mixtures thereof said plasma treatment including converting said gaseous medium into ionized gas composed of electrons and positive ions in such relative numbers that the gaseous medium is essentially neutral, at a temperature between ambient or standard room temperature and below the decomposition temperature or softening temperature of said organic surface.

4,445,992

PLATING APPARATUS

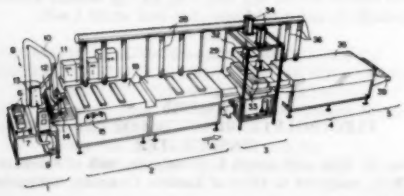
Kenji Yamamoto, Tokyo, Japan, assignor to Electroplating Engineers of Japan, Limited, Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,872

Claims priority, application Japan, Sep. 10, 1981, 56-141649

Int. Cl.³ C25D *17/06, 17/28*

U.S. Cl. 204—203 **8 Claims**



1. An apparatus for electroplating strip-form objects, comprising:

a loading apparatus for feeding a series of rows of the objects, in succession, in a longitudinal feeding direction, each row of the objects extending transversely to said longitudinal feeding direction and comprising a plurality of the objects arranged in side-by-side, laterally aligned relationship;

a pre-treatment apparatus for receiving said rows of the objects in succession from said loading apparatus and subjecting same to pre-treatments effective to prepare the objects for electroplating, said pre-treatment apparatus comprising a first group of aligning rollers for longitudinally aligning each object in a row with the corresponding object in the preceding row whereby the objects are arranged in rank and file order, said pre-treatment apparatus also comprising a first group of feed rollers for receiving the objects from said aligning rollers and moving the objects in rank and file order in said longitudinal feeding direction through said pre-treatment apparatus;

a plating apparatus for receiving the objects discharged from said pre-treatment apparatus one row at a time, said plating apparatus including a partial plating device for injecting electroplating liquid against a portion of the surface of each of the objects to effect electroplating of parts of said surfaces of the objects;

an after-treatment apparatus for receiving said rows of the objects in succession from said plating apparatus and subjecting same to after-treatments for cleaning the objects, said after-treatment apparatus comprising a second group of aligning rollers for longitudinally aligning each object in a row with the corresponding object in the preceding row whereby the objects are again arranged in rank and file order, said after-treatment apparatus also comprising a second group of feed rollers for receiving the objects from the second group of aligning rollers and moving the objects in rank and file order in said longitudinal feeding direction through said after-treatment apparatus;

and an unloading apparatus for unloading the objects from said after-treatment apparatus.

4,445,993

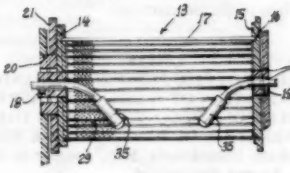
LASER PERFORATED PLATING BARREL AND METHOD OF CONSTRUCTING THE SAME

P. David Stutz, Burr Ridge, and George J. Kuchta, Stickney, both of Ill., ass'gnors to Stutz Company, Chicago, Ill.

Filed Oct. 29, 1981, Ser. No. 316,081

Int. Cl.³ C25D *17/20*

U.S. Cl. 204—213 **2 Claims**



1. An electro-plating barrel comprising:

(a) a thin continuous corrugated wall formed from a chemically inert high-tensile strength plastic having a thickness of less than 0.1875 of an inch,

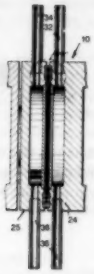
(b) a multiplicity of laser-formed perforations formed therein with said perforations arranged in longitudinal lines parallel to said corrugations with each line horizontally staggered with respect to each other,

(c) each laser-formed perforation includes a slot-like oblong shaped opening formed on the exterior wall surface of said corrugations extending longitudinally thereof with the walls of said openings tapered inwardly to form a reduced oblong oppening on the interior wall surface of said corrugations resulting in a perforated area of not less than 15% and no greater than 30% of the total interior wall surface of the barrel.

4,445,994
ELECTROLYZER FOR ALKALINE WATER ELECTROLYSIS

Jiri Divisek, and Heinz Schmitz, both of Julich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,408
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108255
Int. Cl.³ C25B *9/00, 11/03, 11/06, 13/04*
U.S. Cl. 204—258 **11 Claims**



1. An electrolysis cell component unit for alkaline water electrolysis to generate hydrogen and oxygen gases comprising:

(a) A cathode portion and an anode portion, comprising a pair of electrically conductive separator plates,

(b) insulating means, said insulating means being located between said separator plates to prevent direct electrical contact therebetween,

(c) a porous diaphragm of electrically nonconductive material,

(d) a first metallic mesh and a second metallic mesh, said first metallic mesh being placed upon and in intimate contact with one side of said diaphragm and said second mesh being similarly placed upon the other side of said diaphragm, the interstices of both said meshes being filled with porous activated nickel,

(e) a first and a second lattice of rigid electrically conductive support elements said first lattice placed upon and over its whole surface being in repeating welded electro-conductive connection with said first metallic mesh, and said second lattice being similarly welded to and in electrically conductive relation with said second mesh,

said cathode portion comprising one of said separator plates being in physical contact with a portion of said first mesh and a portion of said first lattice, said physical contact providing electrically conductive connection between the components of said cathode portion, said second lattice, said second mesh and said other separator plate comprising the anode portion being similarly in physical and electrically conductive contact with each other.

4,445,995
CATHODE HEAD HAVING IMPROVED SEAL MEANS

Donald J. Wierschke, Brownsburg, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,560
Int. Cl.³ C25D *1/10;* **C25B** *17/08*
U.S. Cl. 204—281 **6 Claims**

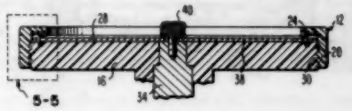
1. In a cathode head for holding a flat circular matrix of a first diameter during electroforming of a replica of a second, smaller diameter on the surface of the matrix, wherein said cathode head is comprised of:

(a) a disc shaped member having an outer diameter at least as large as the first diameter, a flat face for holding said matrix to be replicated and a male thread defined on the outer edge thereof;

(b) a ring member having an integral outer cylindrical portion and a radially inwardly extending portion, said outer cylindrical portion having a female thread which mates with the male threads of the disc shaped member and the radially inwardly extending portion including seal holding means; and

(c) a circumferential seal positioned in said seal holding means

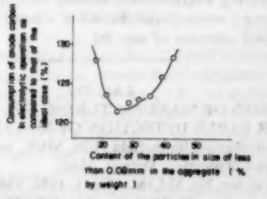
whereby when the ring member is threadably engaged with the outer edge of the disc member and screwed towards the disc member, the circumferential seal engages the outer flat surface of said matrix held on the flat face of the disc shaped member; said improvement comprising: using a circumferential seal having a cross-sectional configuration comprised of integral first and second portions, said first portion being of a shape so as to be held by the seal holding means of the ring member and said second portion being of a substantially right triangular configuration and extending downward from the first portion with a leg side of the triangular portion forming a substantially perpendicular cicumferential wall with respect to the flat surface of said matrix thereby defining an electroforming area of said second diameter, said leg side of the triangular portion extending to an apex where it meets the hypotenuse side of the triangular portion which hypotenuse side then extends upwardly towards the outer edge of the first portion of the seal; whereby the edge formed at the apex of the triangular portion provides an improved electrolyte tight engagement of the seal to said matrix to be replicated and the leg side of the right triangular portion of the seal provides a substantially perpendicular wall against which said replica having a perpendicular edge can be electroformed.



4,445,996
ANODE PASTE FOR USE IN SODERBERG-TYPE ELECTROLYTIC FURNACE FOR ALUMINUM

Yutaka Kawamata, Tokyo, and Shunkichi Katsuki, Kitakyushu, both of Japan, assignors to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,988
Claims priority, application Japan, Jul. 9, 1981, 56-107391
Int. Cl.³ C25C *7/02*
U.S. Cl. 204—294 **5 Claims**



1. An anode paste for use in the fabrication of the self-baking anode of a Soderberg-type electrolytic furnace for the manufacture of aluminum, comprising:

a mixture of an aggregate selected from the group consisting of oil cake and pitch coke and a tar pitch binder, said aggregate being of a size less than 12 mm and containing 20 to 35 wt. % of coke particles of a size less than 0.08 mm, and the weight ratio of the coke particles of a size of 0.2 to

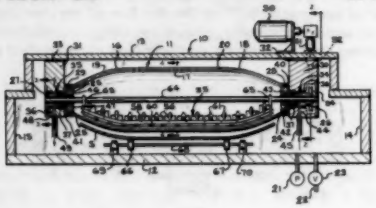
2 mm to the coke particles of a size less than 0.08 mm ranging 0.5 to 1.3, the amount of said binder ranging from 20 to 32% by weight of the total amount of said mixed aggregate and binder.

4,445,997

ROTATABLE SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 17, 1983, Ser. No. 523,969
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—298 **11 Claims**



1. A sputtering cathode for sputter-coating non-planar substrates, comprising a rotatable elongated tubular member having a layer of coating material to be sputtered applied to the outer surface thereof, said tubular member being contoured longitudinally to provide a non-cylindrical sputtering surface.

4,445,998

METHOD FOR PRODUCING A STEEL LITHOGRAPHIC PLATE

Katsumi Kanda, Kudamatsu; Katsunobu Kunimoto, Yamaguchi; Keiji Yamane, and Yoshikazu Kondo, both of Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Japan

Filed Dec. 2, 1981, Ser. No. 326,747
Int. Cl.[3] C25D *5/36, 5/10, 5/12*; B41N *1/08*
U.S. Cl. 264—385 **12 Claims**

1. A method for producing a steel lithographic plate which consists essentially of:

(a) subjecting a steel substrate having a thickness in the range of 50 to 400 cm, to a graining treatment by (i) electroplating with iron, (ii) etching in a solution containing ferric ions or (iii) mechanical treatment with sand or marble, in order to impart to said substrate an average surface roughness in the range of 0.1 to 3 μm,

(b) imparting improved corrosion resistance to the substrate of step (a) by plating with a metal, an alloy or multi-layer of metals, and then

(c) applying a hydrophilic coating with a suspension containing a water-dispersible sol of a metal compound to the treated substrate of step (b).

4,445,999

METHOD OF MANUFACTURING GEL ELECTRODE FOR EARLY DETECTION OF METAL FATIGUE

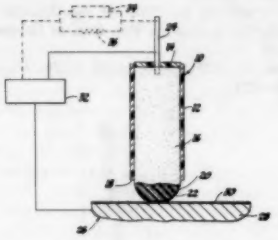
William J. Baxter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 353,163, Mar. 1, 1982. This application Aug. 22, 1983, Ser. No. 525,097
Int. Cl.[3] G01N *27/30*
U.S. Cl. 204—414 **2 Claims**

1. A method for manufacturing an electrode comprising a housing having an opening and a gel body contained in the housing and protruding from the opening so as to form a rounded, pliant contact adapted for operatively and removably contacting a surface without adhering thereto, said method comprising

filling the housing with a warm, viscous liquid of a gel-forming material,

overfilling said housing with said liquid so as to form a convex meniscus at the opening,



cooling the liquid including the meniscus to form a gel, and dehydrating the surface of the gel meniscus to form a skin and to thereby form a pliant, nonadherent contact.

4,446,000

OXYGEN SENSOR AND METHOD FOR MAKING SAME

Daniel Cullinane, Jr., Tapsfield, Mass., assignor to Lynn Products Company, Incorporated, Lynn, Mass.

Filed May 13, 1983, Ser. No. 494,353
Int. Cl.[3] G01N *27/30*
U.S. Cl. 204—415 **12 Claims**

1. In an electro-chemical sensor for measuring concentrations of gas in accordance with the limiting current principle, said sensor comprising an electrolytic cell having a sensing electrode, a counter electrode and an electrolyte forming a current path between said electrodes, and a gas diffusion barrier member for restricting the rate of access of gas to said sensing electrode, the improvement wherein said restricting member is formed of wood generally aligned so the grain of the wood is parallel to the passage of said gas through said restricting member.

4,446,001

RECOVERY OF RETORTED SHALE FROM AN OIL SHALE RETORTING PROCESS

Roland F. Deering, Brea, and John H. Duir, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 451,597, Dec. 20, 1982. This application Dec. 30, 1982, Ser. No. 454,836

Int. Cl.[3] C10G *1/00*

U.S. Cl. 208—11 R **42 Claims**

1. A process for recovering retorted particulates containing combustible materials from a retort in a form suitable for delivery to a fluidized vessel, said process comprising:

(1) removing the particulates from the retort and passing them to a sealing zone;

(2) injecting sealing gas into the particulates within said sealing zone, with at least some of said sealing gas traveling countercurrently to the particulates into the retort;

(3) crushing particulates recovered from step (2) in a crushing zone to a size suitable for fluidization;

(4) holding in a fluidization zone, crushed particulates removed from step (3) as a fluidized bed under substantially non-combustive conditions; and

(5) removing particulates from said fluidization zone.

4,446,002

PROCESS FOR SUPPRESSING PRECIPITATION OF SEDIMENT IN UNCONVERTED RESIDUUM FROM VIRGIN RESIDUUM CONVERSION PROCESS

Charles W. Siegmund, Morris Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 5, 1982, Ser. No. 405,314

Int. Cl.[3] C10C *1/00*; C10L *1/04, 1/06*

U.S. Cl. 208—23 **9 Claims**

1. A process for suppressing the precipitation of sediment in the unconverted residuum obtained from conversion of virgin residuum comprising blending with the unconverted residuum an effective amount of a virgin residuum having an asphaltene content of at least about 8% by weight of the virgin residuum at a temperature sufficient to maintain both the virgin and the unconverted residua during blending at a viscosity of no greater than 100 centistokes.

4,446,003

HEAT RECOVERY PROCESS AND APPARATUS

Stephen R. Burton, Kingsbury; Gary Horley, Walsall, and Ronald C. Hodrien, Solihull, all of England, assignors to British Gas Corporation, London, England

Filed Mar. 29, 1982, Ser. No. 362,594

Claims priority, application United Kingdom, Jun. 2, 1981, 8116905

Int. Cl.[3] C10G *9/12*

U.S. Cl. 208—48 Q **12 Claims**

1. A process for the recovery of heat from the gas leaving a unit for the thermal hydrogeneration of an oil feedstock, said process comprising:

providing a quench zone and a heat recovery zone, said heat recovery zone comprising a plurality of heat exchanger tubes having inlet and outlet ends and means for maintaining a body of quiescent quench liquid adjacent the inlet ends of said heat exchanger tubes, a space being present above said body of quiescent quench liquid in said heat recovery zone;

irrigating all of the internal surfaces of said quench zone with a quench liquid;

introducing gas from said thermal unit into said quench zone to quench the gas by contact with said quench liquid;

separating quenched gas from said quench liquid in said quench zone;

passing separated quench liquid from said quench zone through first conduit means to said heat recovery zone;

maintaining a quiescent body of quench liquid adjacent the inlet ends of said heat exchanger tubes, the outlet end of said first conduit means being located within said quiescent body of quench liquid whereby quench liquid passed from said quench zone to said heat recovery zone is introduced into said body of quiescent liquid;

maintaining the level of said quiscent body of quench liquid above the inlet end of said heat exchanger tubes whereby quench liquid flows into and irrigates all of said heat exchanger tubes; and

passing separated quenched gas from said quench zone through second conduit means to the space above said body of quiescent quench liquid in said heat recovery zone whereby the quenched gas flows with the quench liquid into and through said heat exchanger tubes.

12. A process for recovery of heat from the gas leaving a unit for the thermal hydrogenation of an oil feedstock, which process comprises:

maintaining a body of quench liquid in a lower portion of a quenching zone;

introducing quench liquid into a conduit having an outlet end submerged in said body of quench liquid in said quenching zone, said quench liquid irrigating the entire surface of said conduit;

irrigating all of the internal surfaces of said quenching zone with the quench liquid;

introducing gas from said thermal unit into said quenching zone through said conduit whereby the introduced gas flowing through the submerged outlet end of said conduit bubbles through said body of quench liquid whereby the gas is quenched by said quench liquid;

subsequently separating the quenched gas and the quench liquid in said quenching zone;

passing separated quench liquid from said quenching zone to a heat recovery unit having a heat recovery surface for recovery of heat from said quenched gas;

irrigating, with said separated quench liquid, all of said heat recovery surfaces of said heat recovery unit;

separately passing seperated quenched gas from said quenching zone to said heat recovery unit; and

recovering heat from said quenched gas in said heat recovery unit.

4,446,004

PROCESS FOR UPGRADING VACUUM RESIDS TO PREMIUM LIQUID PRODUCTS

Nai Y. Chen, Titusville; Lillian A. Rankel, Princeton, and Leslie R. Rudnick, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,529

Int. Cl.[3] C10G *69/06*

U.S. Cl. 208—57 **9 Claims**

1. A process for producing high yields of liquid in the gasoline boiling range and low yields of coke from asphaltene-containing residual oil feed of approximate CCR and asphaltene varying from 2 to 30 weight percent, said low coke yields being measured by a coke/CCR ratio of 0.5 to 1.3, comprising:

A. lightly hydrotreating said residual oils over a hydrotreating catalyst, the mols of hydrogen added per mol of average resid being about 0.1–3.0, while minimizing the deposition of metal contaminants on said hydrotreating catalyst and concentrating said contaminants within said coke;

B. fractionating said lightly hydrotreated residual oils and removing a fraction boiling at at least 800° F. at atmospheric pressure; and

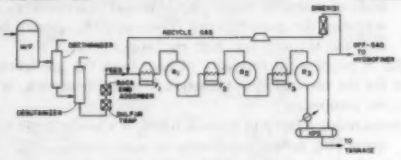
C. thermally cracking said 800° F.+ fraction during a period of 1 to 10 seconds to produce said high yields of liquid and low yields of coke.

4,446,005

GUARD BED FOR THE REMOVAL OF SULFUR AND NICKEL FROM FEEDS PREVIOUSLY CONTACTED WITH NICKEL CONTAINING SULFUR ADSORPTION CATALYSTS

Paul E. Eberly, Jr., and Judeth H. Brannon, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 17, 1982, Ser. No. 419,239
Int. Cl.[3] C10G *25/00*
U.S. Cl. 208—91 5 Claims



1. In a process which includes in combination a hydrofiner, sulfur trap, and reforming unit,

a hydrofiner located upstream of the reforming unit, for hydrofining a sulfur-containing naphtha to remove a major portion of the sulfur and form a low-sulfur naphtha,

a nickel catalyst-containing sulfur trap located downstream of said hydrofiner, the low-sulfur naphtha from the hydrofiner being passed therethrough and contacted with the nickel catalyst to remove sulfur from the naphtha,

a reforming unit for reforming, with hydrogen, the low-sulfur naphtha from the hydrofiner and nickel-containing sulfur trap, the reforming unit containing a plurality of catalyst-containing on-stream reactors connected in series, the hydrogen and low-sulfur naphtha feed flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions,

the improvement comprising

a guard bed, containing an adsorption catalyst, located downstream of said nickel ctalyst-containing sulfur trap, and up-stream of the on-stream reactors of the reforming unit, through which said naphtha is passed,

whereby, when the sulfur concentration, flow rate and operating temperature of the naphtha feed entering said nickel catalyst-containing sulfur trap produce an organo-sulfur nickel complex which is dissolved within the naphtha, the organosulfur nickel complex formed in said nickel catalyst-containing sulfur trap is removed by the adsorption catalyst in said guard bed to suppress poisoning of the catalyst of the on-stream reactors of said reforming unit.

4,446,006

ARSENIC REMOVAL FROM HYDROCARBONS

Walter Albertson, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 13, 1982, Ser. No. 377,615
Int. Cl.[3] C10G *29/06*
U.S. Cl. 208—253 19 Claims

1. A process for reducing the arsenic content of an arsenic-containing hydrocarbon comprising contacting said hydrocarbon with aqueous sodium hydrogen phosphate and removing arsenic components from a product hydrocarbon of reduced arsenic content.

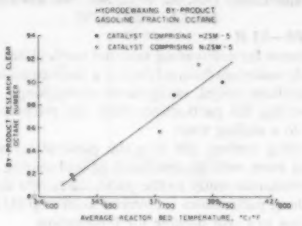
2. A process for reducing the arsenic content of an arsenic-containing hydrocarbon comprising contacting said hydrocarbon with elemental sulfur and aqueous sodium hydrogen phosphate and removing arsenic components from a product hydrocarbon of reduced arsenic content.

4,446,007

HYDRODEWAXING

Fritz A. Smith, Rye, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 8, 1982, Ser. No. 386,463
Int. Cl.[3] C10G *47/16*
U.S. Cl. 208—111 18 Claims


HYDRODEWAXING BY-PRODUCT GASOLINE FRACTION OCTANE
• CATALYST COMPRISING HZSM-5
× CATALYST COMPRISING NiZSM-5
AVERAGE REACTOR BED TEMPERATURE, °C/°F

1. In the method for catalytically hydrodewaxing a petroleum or shale oil fraction in a reactor by contacting said fraction with hydrogen in the presence of a catalyst comprising a crystalline zeolite having a silica to alumina mole ratio of at least 12 at an average reactor temperature of from about 200° C. to about 712° C., a liquid hourly space velocity of from about 0.2 to about 10, a reactor pressure of from about 100 psig to about 3000 psig and a hydrogen to hydrocarbon mole ratio of from about greater than 0 to about 20, and wherein said reactor is started up at an average reactor temperature of from about 200° C. to about 310° C., the improvement which comprises increasing the average reactor temperature in a uniform manner to at least about 360° C. within about the first seven days after start-up of the reactor.

4,446,008

PROCESS FOR HYDROCRACKING OF HEAVY OILS WITH IRON CONTAINING ALUMINOSILICATES

Hajime Shimakawa, and Satoshi Nakai, both of Sodegaura, Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,452
Claims priority, application Japan, Dec. 9, 1981, 56-196972; Feb. 10, 1982, 57-18917
Int. Cl.[3] C10G *47/20*; B01J *29/14, 29/24, 29/34*
U.S. Cl. 208—111 13 Claims

1. A process for hydrocracking heavy oils comprising contacting said heavy oil with a hydrocracking catalyst deposited on a carrier for hydrocracking said heavy oil, said catalyst deposited on a carrier comprising a carrier consisting of from 20 to 80% by weight of iron-containing aluminosilicate and from 80 to 20% by weight of an inorganic oxide, and (i) a catalyst comprising at least one member of the Group VI B metals and (ii) at least one member of the Group VIII metals of the Periodic Table deposited on the carrier, said iron-containing aluminosilicate having been prepared by steam-treating a crystalline aluminosilicate having a molar ratio of silica to alumina of 4.6 or more and a Na_2O content of not more than 2.4% by weight and contacting said steam-treated crystalline aluminosilicate with an aqueous iron salt solution having a pH of 1.5 or less to form said iron-containing aluminosilicate.

4,446,009

SELECTIVE VAPORIZATION PROCESS AND APPARATUS

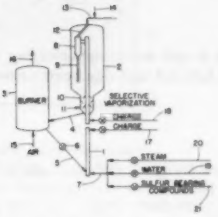
David B. Bartholic, Watchung, N.J., assignor to Engelhard Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 155,736, Jun. 2, 1980. This application May 4, 1981, Ser. No. 260,145

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ C10G *9/32*

U.S. Cl. 208—113 **4 Claims**



1. In a selective vaporization process for decarbonizing and demetallizing heavy petroleum fractions by contacting such fraction and an inert gas for reduction of hydrocarbon partial pressure in a rising confined vertical column with a finely divided inert solid contact material consisting essentially of an inert solid material having a microactivity for catalytic cracking not substantially greater than 20 at low severity, including a temperature of at least about 900° F. for a period of time less than 2 seconds and less than that which induces substantial thermal cracking in said charge, at the end of said period of time separating from said inert solid a decarbonized hydrocarbon fraction of reduced Conradson Carbon number as compared with said charge, reducing temperature of said separated fraction to a level below that at which substantial thermal cracking takes place to terminate said period of time, contacting said separated contact material with an oxidizing gas to burn said combustible deposit and heat the contact material to high temperature and returning the so heated contact material to the lower portion of said confined column for renewed contact with said heavy petroleum fraction; the improvement providing flexibility in rate of charging said fraction, or in control of said residence time or both which comprises introducing liquid water to the lower portion of said confined vertical column and injecting said heavy petroleum fraction to said column above the point of introduction of said liquid water.

4,446,010

FLUID CATALYTIC CRACKING

Randall H. Petty, Nederland, and Burton H. Bartley, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 180,357, Aug. 22, 1980, Pat. No. 4,344,926. This application Jul. 29, 1982, Ser. No. 403,096

Int. Cl.³ C10G *11/18, 25/09*

U.S. Cl. 208—120 **5 Claims**

1. In a fluid catalytic cracking process wherein a sulfur-containing hydrocarbon charge stock is contacted with a fluidized particulate cracking catalyst at a temperature in the range of from about 800° F. to about 1300° F. producing normally liquid hydrocarbon products of said cracking reaction and a sulfur-containing coke deposit on said catalyst, spend coke-contaminated catalyst is regenerated by contacting said spent catalyst with an oxygen-containing gas in a catalyst regeneration zone effecting burning of said sulfurcontaining coke and heating of said catalyst to a temperature in the range of about 1000° F. to about 1500° F. with the production of regeneration gases comprising oxides of carbon and sulfur, and resulting regenerated catalyst is returned to said cracking zone, the improvement which comprises incorporating a minor portion of a particulate solid composite of alumina and bismuth oxide containing 0.1 to 4 weight percent bismuth with said catalyst in an amount sufficient to provide 0.01 to 0.04 weight percent bismuth in the resulting mixture.

4,446,011

PROCESS FOR REGENERATING PEROVSKITE CATALYSTS AND HYDROCARBON TREATING PROCESSES UTILIZING THE REGENERATED CATALYST

Kenneth S. Wheelock, and Robert C. Schucker, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 25, 1982, Ser. No. 411,366

Int. Cl.³ C10G *47/12;* B01J *23/92*

U.S. Cl. 208—121 **25 Claims**

1. A process for regenerating an at least partially deactivated composite catalyst having a carbonaceous deposit at an increased rate of combustion of said carbonaceous deposit, said composite catalyst comprising a perovskite having at least one transition metal cation selected from the group consisting of elements having atomic numbers ranging from 21 through 30, from 39 through 48, from 57 through 80 and from 89 through 92, and at least one other catalytic component, which comprises the steps of:

(a) contacting said deactivated composite catalyst with an oxidizing agent at a temperature of at least about 751° F. (400° C.) for a time sufficient to remove at least a portion of said carbonaceous deposit from said composite catalyst, and

(b) recovering the resulting regenerated composite catalyst.

4,446,012

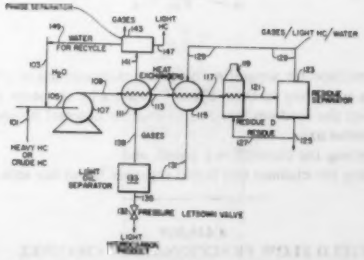
PROCESS FOR PRODUCTION OF LIGHT HYDROCARBONS BY TREATMENT OF HEAVY HYDROCARBONS WITH WATER

Andiappan K. S. Murthy, Lake Hiawatha; Kundanbhai M. Patel, Landing, and Alex Y. Bekker, Teaneck, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 450,710, Dec. 17, 1982, abandoned. This application Jul. 26, 1983, Ser. No. 517,311

Int. Cl.³ C10G *29/02, 35/02;* C07C *4/04*

U.S. Cl. 208—130 **22 Claims**



1. A process for converting heavy hydrocarbons into light hydrocarbons which comprises:

(a) contacting, in a first zone, heavy hydrocarbons having an API gravity at 25° C. of less than about 20 with a liquid comprising water, in the absence of externally added catalyst and hydrogen, at a temperature between about 380° C.–480° C. and at a pressure between about 5000 kPa and about 5,000 kPa (about 2175 psig, about 148 atm), and for a time sufficient to form a uniform mixture;

(b) forwarding the uniform mixture to a second zone while

maintaining the temperature and pressure conditions of the first zone;

(c) maintaining the uniform mixture in the second zone under the temperature and pressure conditions of the first zone, in the absence of externally added catalyst and hydrogen, for a time sufficient to separate the uniform mixture into a residue and a phase comprising light hydrocarbons, gas and water;

(d) withdrawing the residue and said phase from the second zone;

(e) separating said phase into a gaseous product, a liquid comprising water and light hydrocarbon product having an API gravity at 25° C. of greater than about 20 and substantially free of vanadium and nickel values; and

(f) recovering said light hydrocarbon product.

4,446,013

CATALYTIC SKELETAL ISOMERIZATION

Arthur W. Aldag, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1982, Ser. No. 443,720
Int. Cl.³ C07C *5/373*
U.S. Cl. 208—135 **18 Claims**

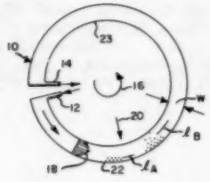
1. A process for the skeletal isomerization of a derivative of cyclopentane comprising the step of contacting said derivative of cyclopentane under suitable reforming conditions with a hydrogel of zinc titanate and an acid carrier.

4,446,014

SEDIMENTATION FIELD FLOW FRACTIONATION CHANNEL AND METHOD

Charles H. Dilks, Jr., 3 Halifax Rd., Newark, Del. 19711, and Wallace W. Yau, 3905 Ardleigh Dr. Greenville, Wilmington, Del. 19807

Filed Nov. 30, 1981, Ser. No. 326,157
Int. Cl.³ B03B *5/62*
U.S. Cl. 209—155 **17 Claims**



9. A method for separating particulates suspended in a fluid medium according to their effective masses by the steps of:

flowing the medium through an annular channel having an annulus axis,

immersing the channel in a liquid, and

rotating the channel and liquid together about the axis.

4,446,015

FIELD FLOW FRACTIONATION CHANNEL

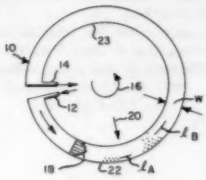
Joseph J. Kirkland, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1981, Ser. No. 326,158
Int. Cl.³ B03B *5/62*
U.S. Cl. 209—155 **2 Claims**

2. A channel assembly forming a channel for sedimentation field flow fractionation comprising:

a dislike hub having a smooth outer peripheral surface,

a continuous outer ring having a radially inner surface, defining a circumferential groove, mating with said hub outer peripheral surface to define an annular channel at the interface between said surfaces, and



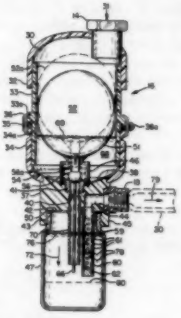
radial bores in said hub communicating with said channel, both said hub and said ring being formed of a plastic.

4,446,016

SOLIDS COLLECTING APPARATUS FOR A VACUUM DRAIN SYSTEM

Kenneth W. Stubbs, Portland, Oreg., assignor to Kenrod Enterprises, Portland, Oreg.

Filed Mar. 16, 1983, Ser. No. 475,886
Int. Cl.³ B01D *21/24*
U.S. Cl. 210—86 **14 Claims**



1. An apparatus for extracting solids from a mixture of liquid and solids flowing in a vacuum drain system, the apparatus comprising:

(a) separator means for separating said solids in said mixture from said liquid;

(b) drain means connected to said vacuum drain system for draining said liquid from said separator means;

(c) reservoir means for accumulating said mixture;

(d) aperture means for permitting said mixture to flow between said reservoir means and said separator means; and

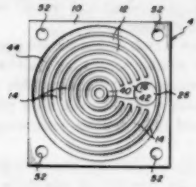
(e) valve means associated with said aperture means and disposed within said reservoir means for sensing the amount of said mixture in said reservoir means and for moving to an open position which permits said mixture to flow through said aperture means into said separator means when a predetermined amount of said mixture has accumulated in said reservoir means and to a closed position which prevents said mixture from flowing through said aperture means.

4,446,017

OIL FILTER ASSEMBLY HAVING A REMOVABLE FILTER MEMBER

Gordon D. Oberg, 1717 S. Lake Stickney Dr., Lynnwood, Wash. 98036

Filed Jun. 10, 1982, Ser. No. 387,151
Int. Cl.³ B01D *27/10*
U.S. Cl. 210—90 **7 Claims**



1. An oil filter assembly, comprising

(a) a sectional housing including base and cover members having adjacent facing planar faces defining a plurality of corresponding circular spaced concentric grooves and further defining a plurality of spaced circular concentric ribs, respectively, said base member planar face also defining a radial groove extending from an inner portion thereof through each of said base member ribs to an outer portion thereof to define a passage affording communication between said base member concentric grooves, said cover member planar face also defining a radial groove extending from an inner portion thereof through each of said cover member ribs to an outer portion thereof to define a passage affording communication between said cover member concentric grooves, said radial grooves of said base and cover members extending diametrically radially outwardly in opposite directions, respectively, said housing defining inlet and outlet openings communicating with said radial grooves adjacent said base and cover member planar face outer portions, respectively;

(b) a planar filter member having a circular configuration and removably mounted between said cover and base member planar faces and extending between said circular grooves defined thereby, respectively;

(c) outer sealing means arranged adjacent the circumference of said filter member for providing a seal between said filter member and said base and cover planar faces, respectively; and

(d) means connecting said base and cover members together on opposite sides of said filter member and for providing that when fluid to be filtered is supplied to said inlet opening, the fluid is distributed across said face of said member defining said inlet opening via said radial and circular grooves thereof, passes through said filter member, and is discharged from said housing via said circular and radial grooves contained in said member defining said outlet opening, and via said outlet opening.

4,446,018

WASTE TREATMENT SYSTEM HAVING INTEGRAL INTRACHANNEL CLARIFIER

Joel A. Cerwick, Lenexa, Kans., assignor to Armco Inc., Middletown, Ohio

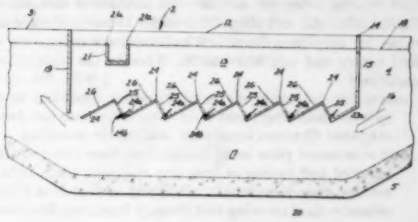
Continuation of Ser. No. 145,707, May 1, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,699
Int. Cl.³ C02F *3/12*
U.S. Cl. 210—195.4 **39 Claims**

1. An intrachannel clarifier for clarifying waste liquid containing settlable solids for use in an aerobic wastewater treatement system of the type having means for retaining the waste liquid in a continuous substantially closed flow path, means for introducing wastewater influent into the flow path, means for removing waste sludge as mixed liquor from the flow path, and means for moving the waste liquor in a single direction in the flow path at sufficient velocity to prevent settling of the suspended solids, said clarifier comprising:

tank means positionable within said retaining means for creating a zone of relatively quiescent waste liquid in the upper portion of the tank means to permit suspended solids to settle downwardly by gravity within the quiescent zone to produce clarified waste liquid;

clarifier inlet means included in said tank means to permit entry of unclarified mixed liquor from the flow path in to the quiescent zone at a relatively slow rate; and

baffle means associated with said tank means for permitting the settled solids to return from the quiescent zone to the flowing mixed liquor within the retaining means but preventing movement of excessive quantities of flowing mixed liquor into the quiescent zone, said baffle means comprising a plurality of spaced parallel slightly overlapping inverted V-shaped angle members configured to extend across the retaining means transversely of the waste liquid flow direction, each of said angle members having a pair of angularly disposed legs configured to lie across the flow path when the clarifier is positioned within the retaining means, adjacent legs of adjoining angle members being spaced to permit the passage of settled solids therebetween, said angle members being configured such that settling of suspended solids occurs in the quiescent zone above said baffle means.

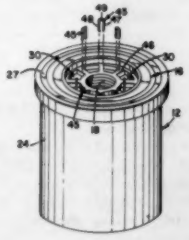


4,446,019

MAGNETIC FILTRATION IN A SPIN-ON FLUID FILTER

Harold L. Robinson, Minnetonka, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sep. 16, 1982, Ser. No. 419,020
Int. Cl.³ B01D *25/06*
U.S. Cl. 210—223 **5 Claims**



1. In a spin-on fluid filter having a housing, means for securing said filter to a fluid source, and filter media contained in said housing, said securing means including an attachment plate having an upper surface area positioned towards said fluid source, a bottom surface area positioned towards said filter media, fluid outlet means and fluid inlet means for providing fluid flow communication between said fluid source and said filter media, and a plurality of fluid impervious web portions, wherein the improvement comprises:

means for providing magnetic filtration capability to said spin-on fluid filter, said fluid filter otherwise not having magnetic filtration capability, said means including

a plurality of clips each constructed and arrange to be removably attached to one of said web portions, each of said clips being constructed from a magnetizable material and including at least one magnetic force field, whereby fluid entering said housing from said fluid source passes through said at least one magnetic force field prior to contacting said filter media.

3. In a spin-on fluid filter having a housing, means for securing said filter to a fluid source, and filter media contained in said housing, said securing means including an attachment plate having an upper surface area positioned towards said fluid source, a bottom surface area positioned towards said filter media, and including fluid outlet means and fluid inlet means for providing fluid flow communication between said fluid source and said filter media, wherein the improvement comprises:

means for providing magnetic filtration capability to said spin-on fluid filter, said fluid filter otherwise not having magnetic filtration capability, said means including

said attachment plate being constructed from a magnetizable material and having at least one magnetic force field extending over substantially all of said surface area thereof, whereby fluid entering said housing from said fluid source passes through said at least one magnetic force field prior to contacting said filter media.

4,446,020

FILTER PRESS

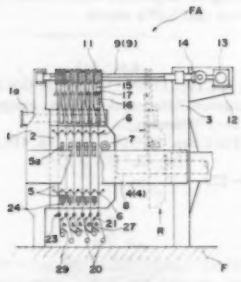
Tetsuya Kurita, Takarazuka, Japan, assignor to Kurita Machinery Manufacturing Company Limited, Osaka, Japan

Filed Dec. 21, 1982, Ser. No. 451,931

Claims priority, application Japan, Dec. 28, 1981, 56-195950[U]; Feb. 10, 1982, 57-19989; Feb. 17, 1982, 57-25081

Int. Cl.³ B01D *25/34*

U.S. Cl. 210—225 **2 Claims**



1. A filter press for separating raw liquid into a filtrate and a filter residue, which includes:

a plurality of filter plates each having a pair of spaced support frames at the lower portion thereof,

a pair of filter cloths disposed between each set of the neighboring filter plates, movably mounted between support stands for selective spacing therebetween or clamping together to each other,

a winding up means arranged to be driven for forward or reverse rotation,

cord members directed around said winding up means and respectively connected to upper edges of said filter cloths for selective lowering of said filter cloths into space between the respective neighboring filter plates or lifting said filter cloths therefrom,

a filter cloth take-up roller journalled between the spaced support frames of each of said filter plates and engaged with the lower edges of said filter cloths which are to be wound thereonto and which hold each of said filter plates therebetween, said filter cloth take-up roller being provided therein with a torsion spring arranged to urge said filter cloth take-up roller in a direction to wind up said filter cloths thereonto,

the improvement comprising:

a pair of filter residue separating members each having a slit passage for passing the filter cloths therethrough so as to separate the filter residue adhering to said filter cloths and each being provided between said spaced support frames of each of said filter plates,

confronting members which define the slit passage between each of said filter residue separating members, and

a spring member expansible and contractible in a direction back and forth with respect to the filter plate being disposed between said filter residue separating members in pair,

whereby upon spacing of said filter plates, said slit passage is positioned along the downward travelling path of said filter cloth generally in a vertical direction, and upon clamping together to each other of said filter plates, said slit passage is accommodated within a thickness of said filter plate through contraction of said spring member.

4,446,021

FILTER-MEDIUM SUPPORT PLATE FOR CENTRIFUGAL FILTER

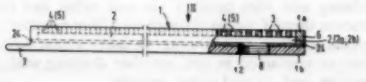
Erhard Aufderhaar, Unterschleissheim; Johannes Feller, Munich; Günther Hultsch, Oberschleissheim, and Walter Kisslinger, Munich, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,089

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133474

Int. Cl.³ B01D *33/02*

U.S. Cl. 210—378 **15 Claims**



1. In a centrifugal filter:

a centrifuge drum rotatable about an axis;

a plurality of support plates lining the drum, each of the plates being generally flat and generally rectangular and having a radially inwardly directed inner face, the plates each being formed with

an array of flow grooves extending on and opening radially inwardly at the inner face and each having an upstream end and an opposite downstream end spaced along the plate from each other, the flow grooves each being of generally regularly increasing flow cross section generally parallel to the inner face from their upstream ends to their downstream ends;

means for draining liquid from the downstream ends; and

a filter medium overlying the inner face over the flow grooves.

4,446,022

VIBRATORY SCREENING APPARATUS FOR SCREENING LIQUIDS

Alan Harry, Royston, England, assignor to Thule United Limited a British Company, Aberdeen, Scotland

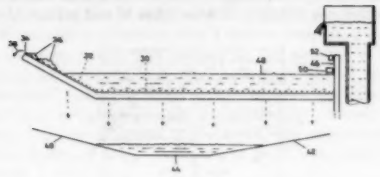
Continuation of Ser. No. 171,283, Jul. 23, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,109

Claims priority, application United Kingdom, Aug. 9, 1979, 7927830

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—388 8 Claims



1. A vibratory screening machine for separating solid particles from liquid, comprising means for introducing a liquid medium having said particles, a fine mesh first screen located within a vibratory basket, means for vibrating the basket, a frame surrounding the screen, the fine mesh screen being in the form of a shallow 'V' with one of the limbs of the 'V' being so inclined that it extends in an upward direction towards a discharge end having a first edge over which filtered particles are discharged due to vibration, the other limb of the 'V' being substantially horizontal and extending between the inclined limb and a weir or dam at the rear of the screen, horizontal bearers within the basket for supporting the frame at the sides of the substantially horizontal portion of the screen, and clamping means for securing the screen within the basket, the clamping means being removable to permit the entire screen and frame to be slidably removed from the basket.

4,446,023

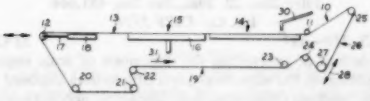
VACUUM BELT FILTER

Henri G. W. Pierson, London Rd., Bozeat, Wellingborough, Northamptonshire, NN9 7JR, England

Filed Aug. 11, 1982, Ser. No. 407,047

Int. Cl.³ B01D *33/04*

U.S. Cl. 210—400 7 Claims



1. A vacuum belt filter apparatus comprising: means for precluding the requirement of heavy tensioning rollers including, an endless filter belt, guide means guiding the filter belt in a substantially horizontal upper run and in a looped lower return run, drive means for moving the belt intermittently outboard toward a forward end in the upper run and inboard away from the forward end in the return run and including first and second displaceable stepping rolls engaging the belt at respective sides of the loop in the return run and being coupled for the alternating arrangement of one extending a respective bight in the belt while the other is reducing a respective bight, a first unidirectional mechanism located in the loop between the first and second displaceable stepping rolls, a second unidirectional mechanism engaging the lower return run downstream of the second displaceable stepping roll, the first and second unidirectional mechanisms being effective in preventing return movement of the belt, a feeding station for feeding slurry onto the belt upper run, vacuum chamber means positioned below the upper run and operative to exert a vacuum and thereby suck away liquid from the slurry for leaving a filter cake on the belt.

4,446,024

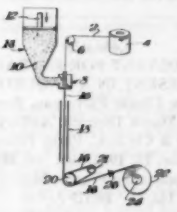
HOLLOW FILAMENT PRODUCT

Richard A. Baker, Newark, Del.; George D. Forsythe, Landenberg, Pa.; Kewal K. Likhyani, Wilmington, Del.; Robert E. Roberts, Kennett Square, Pa., and David C. Robertson, Bear, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation of Ser. No. 872,665, Jan. 22, 1978, abandoned, which is a division of Ser. No. 770,461, Feb. 22, 1977. This application Dec. 13, 1979, Ser. No. 103,201

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—500.2 11 Claims



1. A self-supporting, unitary cylindrical structure having a bore, consisting of rigid, porous, ceramic hollow filament having an outside diameter of at least 0.025 inch arranged in a three-dimensional network of criss-crossing hollow filament through the thickness dimension of the network, the criss-cross pattern of the hollow filament extending in the length-width dimensions, the three-dimensional network of said hollow filament defining tortuous paths for liquid communicating through the thickness dimension of the network.

4,446,025

METHOD OF AND APPARATUS FOR PRE-TREATING MAKE-UP WATER CONTAMINATED WITH NUTRIENTS

Gad Assaf, Rehovot, and Yehuda Cohen, Elat, both of Israel, assignors to Solmat Systems Ltd., Yavne, Israel

Filed Mar. 23, 1982, Ser. No. 361,112

Int. Cl.³ C02F *3/32*; F24J *3/02*

U.S. Cl. 210—602 19 Claims

1. A method for reducing nutrients in brackish water contaminated with nutrients comprising:

(a) establishing a three-layer stagnant pond having an upper, convective wind-mixed layer exposed to solar radiation and of relatively low, uniform salinity, an intermediate stratified, non-convective halocline whose salinity increases monotonically with depth, and a lower collection layer of relatively high, uniform salinity;

(b) adding the brackish water to the wind-mixed layer wherein the nutrients support the growth of photosynthetic microbes;

(c) providing, in the wind-mixed layer, aquatic life that feeds on said microbes and produce fecal pellets of a density in excess of the density of at least the upper layer of the pond, whereby such pellets sink to a level below the upper layer, from which upward diffusion is suppressed by reason of the stratified nature of the halocline; and

(d) using the water in the wind-mixed layer as make-up water in a ultilization device that requires nutrient free water.

7. Apparatus for reducing nutrients in brackish water contaminated with nutrients comprising:

(a) a three layer stagnant pond having an upper, convective wind-mixed layer exposed to solar radiation and of relatively low, uniform salinity, an intermediate, stratified, non-convective halocline whose salinity increases monotonically with depth, and a lower collection layer of relatively high, uniform salinity;

(b) means for adding the brackish water to the wind-mixed layer wherein the nutrients support the growth of photosynthetic microbes;

(c) aquatic life in the wind-mixed layer which feeds on said microbes and produces fecal pellets of a density in excess of the density of at least the upper layer of the pond, whereby such pellets sink to a level below the upper layer, from which upward diffusion is suppressed by reason of the stratified nature of the halocline;

(d) a utilization device requiring nutrient-free make-up water; and

(e) means for adding water from the wind-mixed layer of the stagnant pond to the utilization device.

4,446,026

PROCESS AND SOLVENT FOR EXTRACTION OF THE CHROMATES PRESENT IN AN AQUEOUS SOLUTION

Didier Beutier, Paris; Claude Palvadeau, Breuillet; Gilles Pasquier, Paris, and March Dietrich, Auffargis, all of France, assignors to Krebs & Cie S.A., Paris, France

Filed Mar. 15, 1982, Ser. No. 358,053

Claims priority, application France, Mar. 18, 1981, 81 05413

Int. Cl.³ B01D *11/00*

U.S. Cl. 210—639 **7 Claims**

1. Process for extracting chromates present in an aqueous chlorides-chlorates brine solution comprising the steps of maintaining said solution at a pH lower than 6, bringing said solution into sufficient contact with a liquid organic phase to extract chromates into the organic phase in which the organic phase consists essentially of by volume a mixture of 2 to 10% of a solvent selected from the group of tertiary and quaternary amines and 15 to 40% of a solvent selected from the group of esters of phosphoric acid in a petroleum hydrocarbon system, and extracting said chromates from said organic phase by bringing it into contact with a alkaline removal solution.

4,446,027

BUOYANT MEDIA FILTER

Kathleen W. Simmers, Cockeysville, Md., assignor to Environmental Elements Corp., Baltimore, Md.

Continuation of Ser. No. 135,169, Mar. 20, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 421,816

Int. Cl.³ B01D *23/10, 23/24*

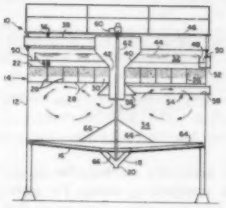
U.S. Cl. 210—661 **11 Claims**

1. A buoyant media containment structure for use in an upflow filter comprising:

(a) buoyant filter media;

(b) porous sheet means formed of a substantially porous material composition, said porous sheet means being constructed and arranged to be supported substantially horizontally in an upper portion of an upflow filter tank and to define with said tank an effluent reservoir above said porous sheet means and an influent reservoir below said porous sheet means; and,

(c) buoyant filter media support means for capturing said buoyant filter media therein and maintaining said influent reservoir substantially free of said buoyant filter media, said support means including a honeycomb-like gridwork of downwardly open cells having sidewalls extending from a lower surface of said porous sheet means, said cells containing said buoyant filter media and substantially preventing said passage of said buoyant filter media from within one of said cells to another of said cells, said cells



being substantially free of subjacent structure limiting free access of particulate waste solids, in turbid influent, to said buoyant filter media in said cells.

6. A method of upflow filtration comprising:

(a) feeding influent into an influent reservoir in the bottom of a tank;

(b) inducing a continuous rising and falling circular flow to said influent;

(c) passing said influent upwardly in said tank and through a buoyant filter media;

(d) maintaining said influent reservoir substantially free of said buoyant filter media;

(e) receiving the filtered influent into an effluent reservoir superposed above said buoyant filter media; and,

(f) passing said effluent from said tank.

4,446,028

ISOPROPENYL PHOSPHONIC ACID COPOLYMERS USED TO INHIBIT SCALE FORMATION

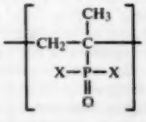
Larry W. Becker, Wilmington, Del., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 20, 1982, Ser. No. 451,644

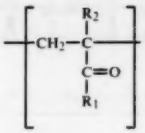
Int. Cl.³ C02F *5/14*

U.S. Cl. 210—697 **12 Claims**

1. Method of controlling the deposition of scale imparting precipitates on the structural parts of a system exposed to an aqueous medium comprising scale imparting precipitates under deposit forming conditions, said method comprising adding to said aqueous medium an effective amount for the purpose of a water soluble copolymer (I) consisting essentially of repeat unit moieties (a) and (b), said repeat unit moiety (a) having the structure



wherein X=OH' or OM, wherein M is a cation, said repeat unit moiety (b) having the structure



wherein R_2 is H, or lower alkyl of from about 1–3 carbon atoms, and wherein R_1 comprises a member selected from the group consisting of hydroxy, hydroxylated alkoxy, and amide, and water soluble salt forms thereof, said copolymer having a molar ratio of a:b of from about 3:1 to about 0.5:1.

8. Method as defined in claim **1** further comprising adding to said system, an effective amount for the purpose, of a compound (II) selected from the group consisting of inorganic phosphoric acids and water soluble salts thereof, phosphonic acids and water soluble salts thereof, organic phosphoric acid esters and water soluble salts thereof, and polyvalent metal salts capable of being dissociated to polyvalent metal ions in water.

4,446,029

DESTRUCTION OF IRON CYANIDE COMPLEXES

Benedicte Betermier, Paris, France; Manuel Alvarez, East Brunswick, and Robert D. Norris, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Sep. 22, 1982, Ser. No. 421,601

Int. Cl.[3] **C02F** *1/30, 1/72*

U.S. Cl. 210—748 **6 Claims**

1. A process for destroying cyanide in an aqueous solution of an iron cyanide complex consisting essentially of:

(a) adjusting the pH of the aqueous solution above 11,

(b) irradiating the solution from step (a) absent hydrogen peroxide with at least 35 kilojoules of 200 to 335 nanometer actinic radiation to destroy said iron cyanide complex and form free cyanide ions,

(c) adding to the solution from step (b) at least 1 gram of hydrogen peroxide per gram of the iron cyanide complex initially contained in the solution,

(d) reducing the pH of the solution from step (c) between 8 and 11, and

(e) reacting the solution from step (d) absent added 200 to 335 nanometer actinic radiation until substantially all of the free cyanide ion is destroyed.

4,446,030

LIQUID CIRCULATION AND PRESSURE TANKS

Henry Schmidt, Jr., Hinsdale, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jan. 25, 1980, Ser. No. 115,343

Int. Cl.[3] **B01D** *29/42*

U.S. Cl. 210—805 **20 Claims**

11. A filter, comprising

a tank having a filter chamber therein,

liquid inlet means for supplying a liquid filtrate to said chamber,

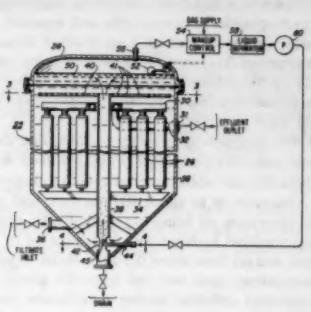
filter means disposed in said chamber for removing entrained particles from a liquid passed through said filter means,

effluent outlet means connected to said filter means,

an upstanding tube in said chamber,

said tube being open to said chamber above said filter means and also being open to said chamber below said filter means, and

means for supplying gas under pressure to the lower end portion of said tube to pump liquid from said chamber below said filter means up through said tube,



whereby the liquid in said chamber is recirculated within said tank.

4,446,031

SEWAGE TREATMENT COMPOSITION ITS MANUFACTURE AND USE

David E. List, Derby, England, assignor to Tioxide Group Limited, Cleveland, England

Filed May 4, 1982, Ser. No. 374,791

Claims priority, application United Kingdom, Jun. 30, 1981, 8120175

Int. Cl.[3] **C09K** *3/00, 3/32*

U.S. Cl. 252—1 **4 Claims**

1. A composition for the treatment of sewage comprising an aqueous solution of ferric sulphate and ferric nitrate in amounts such that the molecular ratio of ferric sulphate to ferric nitrate is from 1:0.75 to 1:1.25 and, optionally nitric acid in an amount of up to 2.5 molecules per molecule of ferric sulphate.

4,446,032

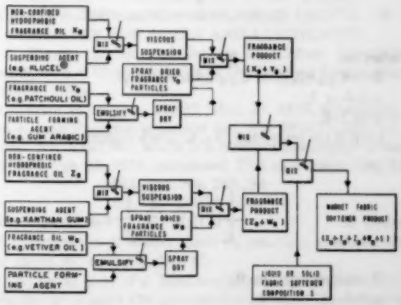
LIQUID OR SOLID FABRIC SOFTENER COMPOSITION COMPRISING MICROENCAPSULATED FRAGRANCE SUSPENSION AND PROCESS FOR PREPARING SAME

Marina A. Munteanu, New York; Christine Cseko, Purchase, both of N.Y.; Edward S. Oltarzewski, Mercerville, N.J.; Jerome I. Lindauer, Hillsdale, N.J., and Donald A. Withycombe, Lincroft, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 294,731, Aug. 20, 1981, Pat. No. 4,428,869. This application Feb. 11, 1982, Ser. No. 348,131

Int. Cl.[3] **D06M** *13/34, 13/00*

U.S. Cl. 252—8.6 **12 Claims**



1. A fragranced fabric softener composition comprising (I)

particles of a composition consisting essentially of (a) from about 1 up to 10 parts by weight of a non-confined fragrance oil substance selected from the group consisting of non-confined hydrophobic fragrance oils and aqueous emulsions of fragrance oils; (b) from about 2 up to about 10 parts by weight of an entrapped fragrance oil capable of being released hydrolytically or by means of application of mechanical pressure, said fragrance oil being physically entrapped in a solid material selected from the group consisting of gelatin, dextrin, gum acacia, urea formaldehyde polymers, modified food starch and synthetic polymers capable of being dissolved or decomposed hydrolytically, said solid material having a particle size of from about 3 microns up to about 800 microns, said physically entrapped fragrance oil being organoleptically compatible with said non-confined hydrophobic fragrance oil or fragrance oil emulsion; and (c) from about 0.1 up to about 10 parts by weight of a suspending agent selected from the group consisting of hydroxypropyl cellulose having a molecular weight of from about 50,000 up to about 800,000; xanthan gum, ethyl cellulose, silica, suspensions of finely divided clay in water, suspensions of an aqueous fluid-absorbing composition comprising water in soluble alkali salts of aqueous alkali saponified, gelatinized-starch-polyacrylonitrile graft polymers which contain gelatinized starch (GS) and saponified polyacrylonitrile (HPAN) in molar ratios of from about 1:1.5 to about 1:9 GS:HPAN, and (II) a solid or liquid fabric softener composition of matter whereby after the fabric softener composition is intimately admixed with said particles and water, and the resulting fragranced fabric softener composition is used to treat a fabric, and the fabric is dried, on wearing, a fragrance is released at high fragrance intensity substantially evenly and uniformly over an extended period of time.

4,446,033

FABRIC CONDITIONING COMPOSITIONS CONTAINING AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

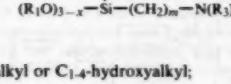
Filed Sep. 22, 1982, Ser. No. 421,182

Claims priority, application United Kingdom, Sep. 25, 1981, 8129070

Int. Cl.³ D06M *13/34*

U.S. Cl. 252—8.6 **6 Claims**

1. A fabric conditioning composition, preferably a liquid rinse softener composition, suitable for use in washing machines comprising from 1% to 95% by weight of active fabric conditioning agents; and from 0.001% to 5% by weight of an amino-silane having the formula



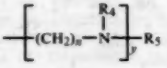
wherein:

R_1=C_{1-4}-alkyl or C_{1-4}-hydroxyalkyl;

x is 0 or 1;

m is 1–6;

each R_3 is hydrogen, R_1, C_{1-6}-alkylamine, or

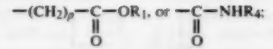


R_4 is hydrogen or R_1;

n is 1–6;

y is 0–6;

R_5=R_4,



p=1–6.

4,446,034

TEXTILE-TREATMENT AGENTS, AND THEIR USE FOR FINISHING TEXTILE MATERIALS

Joachim Kolbe, Leverkusen; Wilfried Kortmann, Hohenlimburg, and Josef Pfeiffer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,866

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138181

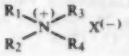
Int. Cl.³ D06M *13/46, 13/40*

U.S. Cl. 252—8.8 **5 Claims**

1. Textile-treatment agents which contain

A. 50–80% by weight of acylated alkanolamines formed from saturated or unsaturated fatty acids having 12–22 C atoms and alkanolamines containing 1 or 2 nitrogen atoms, 1–3 hydroxyl groups and 2–6 C atoms, in a molar ratio of 1:1 to 3:1,

B. 10–30% by weight of water-soluble quaternary ammonium salts of the general formula



wherein

R_1 denotes an alkyl or alkenyl radical having 14–25 C atoms which is interrupted by an amide or ester groups,

R_2 denotes a radical such as R_1 or an alkyl radical having 1–4 C atoms,

R_3 denotes an alkyl radical having 1–4 C atoms or an hydroxyethyl or hydroxypropyl radical,

R_4 denotes an alkyl radical having 1–4 C atoms or an hydroxyethyl, hydroxypropyl or benzyl radical and

$X^{(-)}$ denotes an anion,

C. 2–20% by weight of a fatty acid ester formed from saturated or unsaturated fatty acids having 12–22 C atoms or dicarboxylic acids having 4–10 C atoms and monohydric to tetrahydric alcohols having 3–20 C atoms,

D. 0–20% by weight of ethylene oxide adducts formed from fatty acids having 12–22 C atoms or from fatty alcohols having 8–18 C atoms or from alkylamines or dialkylamines having 12–36 C atoms or from alkylphenols having 10–24 C atoms and 3 to 50 mols of ethylene oxide and

E. 0–25% by weight of diorganopolysiloxanes having a viscosity of 1,000 to 100,000 cSt.

4,446,035

CLEANSING AGENTS AND THE LIKE WITH AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 22, 1982, Ser. No. 421,183

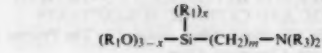
Claims priority, application United Kingdom, Sep. 25, 1981, 8129071

Int. Cl.³ C11D *3/08, 9/36*

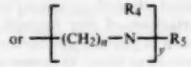
U.S. Cl. 252—8.8 **13 Claims**

1. A composition of matter, comprising:

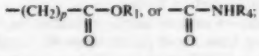
(A) an amino-silane ingredient of the formula:



wherein:
R_1=C_{1-4}-alkyl or C_{1-4}-hydroxyalkyl;
x is 0 or 1;
m is 1–6;
each R_3 is hydrogen, R_1, C_{1-6}-alkylamine,



R_4 is hydrogen or R_1
n is 1–6
y is 0–6
R_5=R_4,



p=1–6.

(B) an ingredient selected from the group consisting of:
(i) organic detersive surfactants;
(ii) fabric softeners;
(iii) bleaches;
(iv) caustics;
(v) metal sequestering and detergent builder agents; or
(vi) mixtures of the foregoing ingredients (i)-(v).

4,446,036

PROCESS FOR ENHANCED OIL RECOVERY EMPLOYING PETROLEUM SULFONATE BLENDS

Wen-Ching Hsieh, Chino Hills; June M. Bostich, Brea, and Jeffery W. Koepke, La Habra, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Jun. 9, 1982, Ser. No. 386,665
Int. Cl.³ C09K *7/02;* **E21B** *43/16*
U.S. Cl. 252—8.55 D **46 Claims**

1. In a method for recovering petroleum from a subterranean reservoir including the steps of injecting into said reservoir through an injection well a micellar displacement fluid comprising a micellar solution, a mobility buffer, and thereafter injecting an aqueous flooding medium to drive said micellar displacement system towards a spaced production well from which fluids are recovered, the improvement which comprises injecting into the reservoir a micellar solution comprising a liquid hydrocarbon, a C_3 to C_8 monohydric alcohol or a glycol ether, a brine and a blend of hydrocarbon sulfonates produced by the steps of:
(A) separately sulfonating two or more different hydrocarbon fractions boiling above 700° F. by contact with a sulfonating agent under reaction conditions; and
(B) neutralizing th sulfonated fractions obtained from step (A) with a neutralizing agent so as to produce petroleum sulfonates.

4,446,037

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 267,105, May 26, 1981. This application Apr. 4, 1983, Ser. No. 481,706
Int. Cl.³ C10M *1/32, 1/38*
U.S. Cl. 252—47.5 **19 Claims**

1. A reaction product made by reacting hydrolyzed imidazoline with an aldehyde and a mercaptan, using a molar ratio of from about 1:1:05 to about 1:1:1, respectively, the reaction taking place at from about 110° C. to about 150° C.

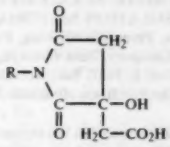
4,446,038

CITRIC IMIDE ACID COMPOSITIONS AND LUBRICANTS CONTAINING THE SAME

Raymond C. Schlicht, Fishkill, and Anthony P. Skrobul, Beacon, both of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

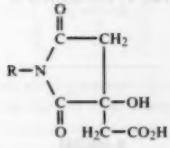
Filed Sep. 27, 1982, Ser. No. 423,938
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 A **12 Claims**

1. An oleaginous composition comprising a major proportion of a mineral or synthetic oil of lubricating viscosity and a minor friction reducing amount of the citric imide represented by the formula:



wherein R is a hydrocarbyl radical of about 5 to about 30 carbon atoms, or R'NHR" in which R' is a divalent alkylene radical of 2 to 10 carbon atoms and R" is a hydrocarbyl radical having from 5 to 30 carbon atoms.

12. A method for operating an internal combustion engine which comprises supplying to the crankcase and lubricating system of said engine, a lubricating oil composition comprising a major portion of a mineral or synthetic oil of lubricating viscosity and a minor friction reducing amount of the citric imide acid represented by the formula:



wherein R is a hydrocarbyl radical of about 5 to about 30 carbon atoms, or R'NHR" in R' is a divalent alkylene radical of 2 to 10 carbon atoms and R" is a hydrocarbyl radical having from 5 to 30 carbon atoms.

4,446,039

ORGANIC COMPOSITIONS CONTAINING HYDROXY-AROMATIC COMPOUNDS USEFUL AS ADDITIVES FOR FUELS AND LUBRICANTS

John F. Pindar, Euclid, and Jerome M. Cohen, University Heights, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 22,537, Mar. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 697,177, Jun. 17, 1976, Pat. No. 4,147,643, which is a continuation-in-part of Ser. No. 661,906, Feb. 26, 1976, abandoned. This application May 13, 1981, Ser. No. 263,254
Int. Cl.³ C10M *1/20*
U.S. Cl. 252—52 R **12 Claims**

1. A composition of matter made by reacting, at a temperature of about 30° to about 220° C.:
(A) one molar part of at least one aromatic compound having (i) one or more OH groups directly bonded to a carbon atom of an aromatic nucleus,
(ii) at least one aromatic hydrogen atom, and

(iii) at least one hydrocarbon-based aliphatic substituent of at least about 50 carbon atoms;

(B) 1–5 molar parts of at least one aldehyde of 1 to about 30 carbon atoms or reactive equivalent thereof; and

(C) 1–5 molar parts of at least one dihydroxy or trihydroxy benzene with at least one R′ substituent, said R′ being hydrogen or R″ and R″ being a C_{1-30} hydrocarbon-based group;

wherein (A) and (C) are not the same.

4,446,040

STRONG, HEAT STABLE, WATER REPELLENT, EXPANDED PERLITE/ALKALI METAL SILICATE INSULATION MATERIAL

Sudarsan C. Samanta, Plymouth Meeting, Pa., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed Oct. 1, 1982, Ser. No. 432,355

Int. Cl.³ C04B *43/00*; E04B *1/80*

U.S. Cl. 252—62 **30 Claims**

1. A thermal insulation material having an average maximum linear shrinkage of 2% or less at temperatures up to 1200° F. made by the process of:

(a) mixing expanded perlite, alkali metal silicate, water, up to 15 parts by weight of kaolin clay per 100 parts by weight of expanded perlite and up to 2 parts by weight of an organic fiber per 100 parts by weight of expanded perlite to form a mixture, the alkali metal silicate and water content of said mixture being between 60% and 140% by weight of the expanded perlite content of said mixture;

(b) pressing said mixture in a suitable mold to form a molded article; and

(c) curing and drying said molded article at a temperature of between about 140° F. and about 170° F.

4,446,041

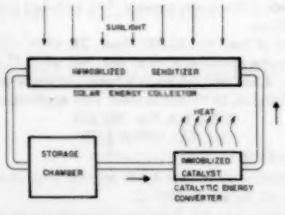
SOLAR ENERGY SYSTEM

Michael P. Neary, 409 E. Coronado #2, Santa Fe, N. Mex. 87501

Continuation of Ser. No. 74,422, Sep. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 894,826, Apr. 10, 1978, abandoned. This application Mar. 10, 1981, Ser. No. 242,182

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—70 **2 Claims**



1. A new composition of matter comprising Norbornadiene-Quadricyclene having reduced flammability by the addition of a halogenated hydrocarbon.

4,446,042

BRIGHTENER FOR DETERGENTS CONTAINING NONIONIC AND CATIONIC SURFACTANTS

Kenneth A. Leslie, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1982, Ser. No. 434,765

Int. Cl.³ C11D *1/835, 3/42, 17/08*

U.S. Cl. 252—102 **10 Claims**

1. A stable aqueous liquid laundry detergent composition comprising:

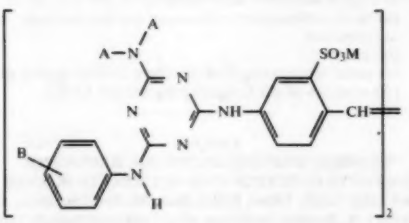
(a) from about 5% to about 95% by weight of a surfactant mixture consisting essentially of:

(i) an ethoxylated alcohol or ethoxylated alkyl phenol nonionic surfactant of the formula $R(OC_2H_4)_nOH$, wherein R is an aliphatic hydrocarbon radical containing from about 10 to about 18 carbon atoms or an alkyl pheny radical in which the alkyl group contains from about 8 to about 15 carbon atoms, and n is from about 2 to about 9, said nonionic surfactant having an HLB of from about 5 to about 14; and

(ii) a quaternary ammonium cationic surfactant having 2 chains which each contain an average of from about 12 to about 22 carbon atoms;

the weight ratio of said nonionic surfactant to said cationic surfactant being from about 2:1 to about 40:1; and

(b) from about 0.01% to about 3% by weight of an anionic brightener of the formula



wherein each A is hydrogen, methyl, ethyl, isopropyl, 2-hydroxyethyl, 2-hydroxypropyl, or propanamido, or taken together are morpholino or anilino; and each B is hydrogen or $—SO_3M$, wherein M is a compatible cation and the total number of $—SO_3M$ groups in the molecule is from 3 to 6 with no more than 2 $—SO_3M$ groups per anilino group;

the equivalent weight ratio of said cationic surfactant to said brightener being greater than about 3.

4,446,043

BUILT LIQUID DETERGENT COMPOSITIONS

Ho T. Tai, Santes, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,671

Claims priority, application United Kingdom, Sep. 1, 1981, 8126444

Int. Cl.³ C11D *3/06, 7/56*

U.S. Cl. 252—105 **6 Claims**

1. A low viscosity built liquid detergent composition comprising:

(i) from 22 to 32% by weight of sodium triphosphate;

(ii) from 6 to 15% by weight of an active detergent mixture of

(a) a water-soluble anionic sulphonate or sulphate detergent;

(b) an alkali metal soap of fatty acids having from 12 to 18 carbon atoms;

(c) a nonionic detergent; in a weight ratio of (a):(b):(c) of (4.5–8.5):(0–3):(1.5–4);

(iii) from 2 to 10% by weight of an alkali metal sulphite; and

(iv) from 0.2 to 2% by weight of a non-detergent short-chain

alkyl-substituted benzene sulphonate having 1–4 carbon atoms in the alkyl substituent(s); the liquid detergent composition characterized by a viscosity of not more than 0.7 Pascal seconds when measured at 20° C. and at 21 seconds^{-1} shear rate.

4,446,044

AQUEOUS WATER-IN-OIL CLEANING EMULSION

Andrew F. Rutkiewic, West Chester, Pa., and James P. White, Pensauken, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 252,573, Apr. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,421, Nov. 19, 1980, abandoned. This application May 7, 1982, Ser. No. 376,232

Int. Cl.^{3} **C11D** *1/72, 3/43, 17/08;* **C23G** *5/02*

U.S. Cl. 252—170 **5 Claims**

1. A cleaning composition of a water-in-oil emulsion consisting essentially of:

(a) a dispersed phase of 70–85 percent by weight, based on the weight of the emulsion, of water;

(b) a continuous phase of 10–25 percent by weight, based on the weight of the emulsion, of oil, wherein said oil is a blend of aromatic organic solvents or aromatic and aliphatic organic solvents having a solvency parameter with a dispersion component value of 7.70–8.80, a polar component value of 0–0.70, and a hydrogen bonding component value of 0.005–1.42;

(c) 1.5–7.5 percent by weight, based on the weight of the emulsion, of at least one hydrophobic nonionic surfactant having an HLB value less than 3; and

(d) 1.5–7.5 percent by weight, based on the weight of the emulsion, of at least one hydrophilic nonionic surfactant having an HLB value greater than 10 and soluble in solvent blends having a solvency parameter with a polar component value less than 0.9 or a hydrogen bonding component value less than 1.

4,446,045

COMPOSITION FOR TREATING AQUEOUS MEDIUMS

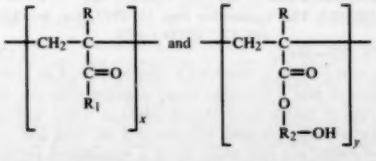
William R. Snyder, Warminster, and Diane Feuerstein, Bensalem, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 249,774, Apr. 1, 1981, Pat. No. 4,374,733. This application Dec. 13, 1982, Ser. No. 449,031

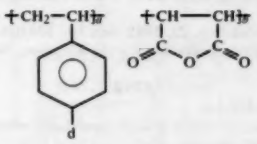
Int. Cl.^{3} **C02F** *5/10*

U.S. Cl. 252—180 **12 Claims**

1. Composition for controlling the deposition of scale imparting precipitates on the structural parts of a system exposed to an aqueous medium containing scale imparting precipitates under deposit forming conditions, said composition also being adapted for dispersing solids particulate matter, said scale imparting precipitates being selected from the group consisting of calcium carbonate, calcium phosphate, and calcium sulfate, said solids particulate matter being selected from the group consisting of iron oxide and clay, said composition comprising an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof, and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer have the following formula



wherein R is hydrogen or a lower alkyl of from about 1 to 3 carbon atoms, R_1 is OH, OM, or NH_2 where M is a water soluble cation, R_2 is a lower alkyl group of from about 2–6 carbon atoms and the molar ratio of x:y is about 34:1 to 1:4, and an effective amount of a water soluble polymer (II) or water soluble salt or hydrolysate acid form thereof, said polymer (II) having the formula:



wherein a or b may be zero or a positive integer, with the proviso that (a+b) must be >1, d=H or HSO_3.

4,446,046

POLY (ALKENYL) PHOSPHONIC ACID AND METHODS OF USE THEREOF

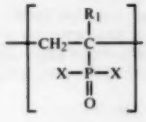
Larry W. Becker, Wilmington, Del., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 274,700, Jun. 17, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,569

Int. Cl.^{3} **C02F** *5/14*

U.S. Cl. 252—181 **9 Claims**

1. Method of inhibiting corrosion of and deposit formation along metallic parts in contact with a boiler water system comprising adding to said system an effective amount of a water soluble polymer (I) having a repeat unit represented by the formula



wherein R_1 is a lower alkyl group of one to about six carbon atoms, and wherein X=OH or OM, where M is a cation.

4,446,047

PLEOCHROIC ANTHRAQUINONE DYES

David J. Thompson, Manchester, England, assignor to Imperial Chemical Industries PLC, London, England

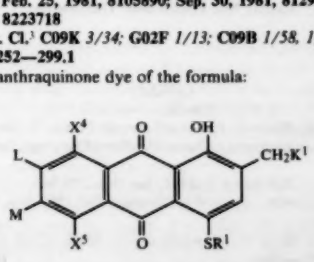
Continuation-in-part of Ser. No. 352.058, Feb. 24, 1982. This application Aug. 24, 1982, Ser. No. 411,094

Claims priority, application United Kingdom, Feb. 25, 1981, 8105888; Feb. 25, 1981, 8105890; Sep. 30, 1981, 8129518; Aug. 18, 1982, 8223718

Int. Cl.^{3} **C09K** *3/34;* **G02F** *1/13;* **C09B** *1/58, 1/60*

U.S. Cl. 252—299.1 **8 Claims**

1. An anthraquinone dye of the formula:



wherein L & M are H or CH_2K^1; X^4 & X^5 are OH or SR^2 provided that when X^4 is OH X^5 is SR^2, L is CH_2K^2 and M is H; and when X^5 is OH X^4 is SR^2, M is CH_2K^2 and L is H; K^1 & K^2 are C_{1-20}-alkyl; R^1 is mono- or bi-cyclic aryl; and R^2 is

different to R^1 and selected from C_{1-20}-alkyl, mono- or bicyclic aryl and C_{4-8}-cycloalkyl.

4,446,048

LUMINESCENT MATERIALS

Peter W. Ranby, Middlesex, and David R. Palowkar, London, both of England, assignors to Thorn Emi Limited, London, England

Filed Nov. 23, 1981, Ser. No. 324,026

Claims priority, application United Kingdom, Nov. 25, 1980, 8037726

Int. Cl.³ C09K *11/463*

U.S. Cl. 252—301.4 S **12 Claims**

1. A phosphor for use in a fluorescent lamp which comprises an alkaline earth sulphate of which at least 50% of the alkaline earth of said alkaline earth sulphate is calcium but wherein up to 50% of the alkaline earth of said alkaline earth sulfate may be strontium, with the balance of said alkaline earth being calcium, and which additionally contains the following percentages by weight of the alkaline earth sulphate

(a) from 0.5 to 10 of cerium,

(b) up to 10 of manganese,

(c) from 0.001 to 3 of an alkali metal selected from lithium, sodium and potassium, and

(d) from 0.001 to 8 of boron.

4,446,049

YELLOW-EMITTING HALOPHOSPHATE PHOSPHOR OF IMPROVED BRIGHTNESS AND METHOD

Romano G. Pappalardo, Sudbury, and Thomas E. Peters, Chelmsford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 21, 1982, Ser. No. 435,846

Int. Cl.³ C09K *11/435*

U.S. Cl. 252—301.6 P **11 Claims**

1. A yellow-emitting halophosphate luminescent material exhibiting characteristic peak emission at about 575 nanometers when excited by ultraviolet light, said luminescent material having a composition defined by the general formula:

$$Ca_{(5-v-w-x-y)}Me_vSn_wMn_x(PO_4)_3F_z$$

where Me is a divalent metal partially substituting for calcium, tin is in the stannous state, manganese is in the manganous state, and

$0.001 \leqq v \leqq 0.10$

$0.01 \leqq w \leqq 0.06$

$0.15 \leqq x \leqq 0.35$

$0.08 \leqq y \leqq 0.16$

$0.90 \leqq z \leqq 1.10$

4,446,050

Patent Not Issued For This Number

4,446,051

WATER-IN-OIL EMULSIONS

Daniel P. M. Berthod, Paris, and Simone Ferret, St. Denis, both of France, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,563

Claims priority, application European Pat. Off., Sep. 15, 1980, 80303230

Int. Cl.³ B01J *13/00*; **A01N** *61/02*; **A61K** *31/00, 47/00*

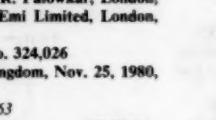
U.S. Cl. 252—309 **16 Claims**

1. A high internal phase water-in-oil emulsion stable through at least two freeze thaw cycles consisting essentially of:

(a) from 1.4 to 24.3% by weight of a branched chain non-polar oil;

(b) from 0.5 to 10% by weight of a non-anionic liquid emulsifier having an HLB value of from 1 to 7;

(c) from 0.1 to 5% by weight of a reaction product of a sodium magnesium-fluorolithosilicate trioctahedral montmorillonite clay and the quaternary ammonium salt having the formula:



where R represents hydrogenated tallow fatty acid radicals;

(d) from 0.1 to 5% by weight of a water-soluble magnesium salt; and

(e) from 0.1 to 97.9% by weight of water;

the aqueous phase forming from 75 to 98% by volume, and the oily phase forming from 25 to 2% by volume of the emulsion.

4,446,052

AQUEOUS GEL CONTAINING TRICALCIUM DI(1-HYDROXY-3-AMINOPROPANE-1,1-DIPHOSPHONATE

Richard J. Sunberg, Oxford, and James J. Benedict, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 17, 1982, Ser. No. 379,234

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—315.1 **2 Claims**

1. An aqueous gel containing from about 0.01% to about 3% tricalcium di(1-hydroxy-3-aminopropane-1,1-diphosphonate).

4,446,053

BETA-AMINO ACID DERIVATIVES AND FRICTION-MODIFIED LUBRICATING COMPOUNDS CONTAINING SAME

Anthony P. Skrobul, Beacon, and Benjamin J. Kaufman, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,160

Int. Cl.³ C10M *1/36, 1/54*

U.S. Cl. 252—33.6 **6 Claims**

1. A friction-reducing additive for lubricating oils having the formulas:

$$RNHCH_2CH_2CO_2^-X^+ \text{ and } RNHCH_2CH_2CONH_2$$

wherein R is a straight chain radical having from 10 to 30 carbon atoms and X is sodium or potassium.

4,446,054

DEMULSIFICATION OF SURFACTANT-PETROLEUM-WATER FLOOD EMULSIONS

Donald U. Bessler, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 713,707, Aug. 12, 1976, Pat. No. 4,089,803. This application Sep. 21, 1977, Ser. No. 835,390

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—344 **4 Claims**

1. A composition comprising a demulsifier and an amine or salt thereof, said demulsifier being selected from the group consisting of oxyalkylated phenol-aldehyde resins, sulfonates, oxyalkylated alkylphenols, oxyalkylated alcohols and oxyalkylated esters, and said amine being a polyalkanol amine, the ratio of demulsifier to amine ranging from 0.12:1 to 125:1.

4,446,055

MODIFIER FOR EFFECTING PHYSICAL PROPERTIES OF FOOD AND FOOD GRADE COMPOSITIONS

Syed M. M. Shah; Anthony J. Luksas, both of Chicago, and Salah E. Ahmed, La Grange Park, all of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Mar. 6, 1979, Ser. No. 17,978
Int. Cl.[3] B01F *17/00*
U.S. Cl. 252—351 21 Claims

1. A food-grade modifier comprising a water-insoluble substantially neutralized solid complex precipitate of calcium, phosphorous, and at least one amino acid selected from the group consisting of tyrosine, lysine and aspartic acid and mixtures thereof, and wherein the pH of the complex precipitate, as measured from the precipitating medium therefore, is at least 5.5 and less than 8.0, the ratio of calcium to amino acid in the complex precipitate is from 5:1 to 0.5:1, and the ratio of calcium to phosphorous in the complex precipitate is from 4:1 to 0.5:1.

4,446,056

PREPARATION OF MIXTURE OF NITROGEN AND SULFUR-NITROGEN HETEROCYCLICS AND USE IN CORROSION INHIBITING

Neil E. S. Thompson, Creve Coeur, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 10, 1979, Ser. No. 101,953
Int. Cl.[3] C23F *11/04, 11/16*
U.S. Cl. 252—391 15 Claims

1. A process of preparing sulfur-containing compositions which comprises reacting hexahydrotriazines in the presence of a Lewis acid at a temperature between 80° C. and 300° C. for a period of about 0.5 to 24 hours, or the precursors thereof, with a member from the group consisting of sulfur and sulfur-containing compounds, where the precursors are aldehydes, except for acetaldehyde, reacted with ammonia.

2. The product of claim 1.

3. A process of inhibiting corrosion which comprises treating a system with the product of claim 2.

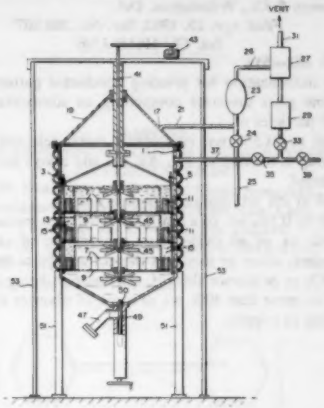
4,446,057

APPARATUS AND METHOD FOR THE MANUFACTURE OF GAS FILTERS

Kung-You Lee; Matthew A. McMahon, both of Wappingers Falls, N.Y., and Justin C. Powell, Fairfax, Va., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 8, 1982, Ser. No. 396,518
Int. Cl.[3] B01J *23/08*
U.S. Cl. 502—355 8 Claims

1. A method for coating a plurality of substrates with an alumna hydrate film comprising the steps of contacting a caustic solution with in a coating vessel said substrates to be coated and with a plurality of porous containers having aluminum metal therein; reacting said aluminum metal with said caustic solution to form a coating solution; separating gas bubbles produced from said reaction of said aluminum metal with said caustic solution from said substrates through the use of a partition between said porous containers and said substrates, said partition guiding said gas bubbles away from said substrates to



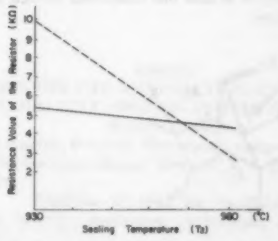
a position where said gas bubbles can be eliminated; and depositing alumina hydrate on said substrates.

4,446,058

RESISTOR COMPOSITION FOR RESISTOR-INCORPORATED SPARK PLUGS

Masao Sakai, Kasugai; Miyakazu Hashizume, Aichi; Yasuhiko Suzuki, Aichi, and Makoto Sugimoto, Aichi, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 29, 1982, Ser. No. 393,305
Claims priority, application Japan, Jul. 16, 1981, 56-109971
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—507 12 Claims



1. A resistor composition for resistor-incorporated spark plugs, consisting essentially of 100 parts by weight of a base mixture consisting essentially of 30 to 70% by weight of glass frit and the balance of an inorganic aggregate consisting essentially of one or more substances selected from the group consisting of alumina, zircon, mullite, silica, clay, silicon nitride, aluminum nitride and boron nitride;

0.1 to 7.0 parts by weight, calculated as carbon on sintering, of a carbonaceous material;

and 0 to 30 parts by weight of an agent for stabilizing the resistance of the resistor under load,

wherein the glass frit contains 10 to 100% by weight of lead glass having a PbO content of 30 to 88% by weight and a softening point of 300° to 600° C., the balance of the glass frit being a glass having a softening point which exceeds 500° C.

4,446,059

CONDUCTOR COMPOSITIONS

Albert L. Eustice, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 15, 1982, Ser. No. 368,807
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—514 10 Claims

1. A metallization for printing conductor patterns upon a soda lime glass substrate comprising an admixture of finely divided particles of

(1) 60 to 98.5% wt. conductive metal selected from the group consisting of Ag, Au, Cu and alloys and mixtures thereof,

(2) 20 to 1% wt. inorganic binder, and

(3) 20 to 0.5% wt. of a colorant which is a mixture of 5 to 60% wt. of an oxide of or a precursor of an oxide of copper, silver or mixtures thereof and 95 to 40% wt. of B_2O_3 or precursor thereof, the colorant being comprised of no more than 40% wt. of oxide of silver or 60% wt. of oxide of copper.

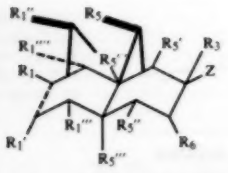
4,446,060

MONO-OXOMETHYL SUBSTITUTED POLYHYDRODIMETHANONAPHTHALENE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

Mark A. Sprecker, Sea Bright; Marie R. Hanna, Hazlet; Richard J. Tokarzewski, Keyport; Robert P. Belko, Woodbridge; Hugh Watkins, Lincroft, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 354,387, Mar. 2, 1982, Pat. No. 4,391,284. This application Mar. 24, 1983, Ser. No. 478,353
Int. Cl.[3] A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 12 Claims

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of perfume compositions and, colognes, comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:

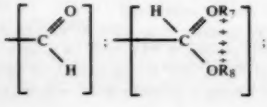


wherein the dashed line represents a carbon-carbon double bond or a carbon-carbon single bond; wherein R_1, R_1', R_1'', R_1''', R_1'''', R_3, R_5, R_5', R_5'', R_5''', R_5'''' and R_6 represent hydrogen or methyl; with the provisos:

(i) at least four of R_1, R_1', R_1'', R_1''' and R_1'''' represents hydrogen; and

(ii) at leat four of R_5, R_5', R_5'', R_5''', R_5'''' represent hydrogen;

with Z being a moiety selected from the group consisting of:



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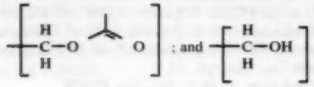


with the line:

[++++]

representing a carbon-carbon single bond or no bond at all; and R_7 and R_8 being separately C_1–C_4 lower alkyl or, taken together, being C_2–C_4 alkylene.

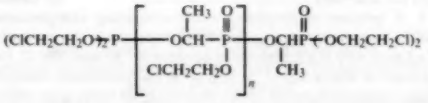
4,446,061

COMPOSITION CONTAINING REACTION PRODUCTS OF METAL OXIDES AND SALTS WITH PHOSPHORUS COMPOUNDS

Samuel F. Joyce, III, Ballwin, Mo.; Albert W. Morgan, Collinsville, Ill.; Norman W. Touchette, and William Vanderlind, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 88,308, Oct. 25, 1979, Pat. No. 4,260,542, which is a division of Ser. No. 898,590, Apr. 21, 1978, Pat. No. 4,206,133, which is a division of Ser. No. 724,192, Sep. 17, 1976, Pat. No. 4,133,823, which is a continuation-in-part of Ser. No. 553,947, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 223,295, Feb. 3, 1972, abandoned. This application Oct. 23, 1980, Ser. No. 199,809
Int. Cl.[3] C09K 15/34
U.S. Cl. 252—602 10 Claims

1. A composition comprising a plasticizer and a reaction product of a phosphite/phosphonate of the formula



wherein n has a value from 0 to 4 and a compound selected from the group consisting of a metal oxide and a metal salt.

4,446,062

MIXED PHENYL/MESITYL PHOSPHATE ESTER COMPOSITION

Fui-Tseng H. Lee, Princeton; Charles V. Juelke, Belle Mead, and Joseph H. Finley, Metuchen, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 16, 1982, Ser. No. 348,636
Int. Cl.[3] C09K 3/28
U.S. Cl. 252—609 3 Claims

1. A fire retardant composition comprising a polyphenylene ether-polystyrene resin and a mixed phenyl/mesityl phosphate ester fire retardant containing by weight about 20% triphenyl phosphate, about 40% diphenyl mesityl phosphate and about 40% phenyl dimesityl phosphate, said mixed ester having a viscosity at 65.5° C. no greater than about 0.000024 meter^2 per second and having a phosphorus analyses of from about 8.2% to about 8.4% made by:

(a) heating from about 1.02 to about 1.23 moles of distilled still bottom phenols containing more than 95 weight percent of mesitol, no more than about 2 weight percent 2,4-xylenol and no more than about 0.5 weight percent of total 2-methyl phenol isomers in the presence of a Friedel-Crafts catalyst to a temperature of about 120° C. to 130° C. and adding with agitation about 1.0 mole of phosphorus oxychloride over a period of time to form a reaction mixture;

(b) maintaining the temperature of the reaction mixture at

120° C. to 130° C. until the amount of unreacted mesitol is less than one weight percent of said distilled still bottom phenols;

(c) adding to the reaction mixture with agitation over a period of time from about 1.9 to about 2.12 moles of phenol while continuing to maintain said reaction mixture at 120° C. to 130° C.;

(d) heating said reaction mixture up to about 220° C. after addition of all of the phenol and maintaining said reaction mixture at that temperature with agitation for sufficient time to form a mixed phosphate ester composition; and

(e) distilling said mixed phosphate ester composition and collecting a product boiling at about 214° C. to 240° C./2 mm Hg.

4,446,063

DISPOSAL OF RADIOACTIVE WASTE

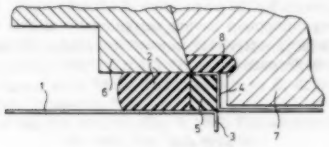
Richard J. Critchley, Chorley, and Roy J. Swindells, Stockport, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Oct. 13, 1981, Ser. No. 310,842

Claims priority, application United Kingdom, Oct. 29, 1980, 8034763

Int. Cl.[3] **G21F** *9/22, 5/00*

U.S. Cl. 252—633 **4 Claims**



1. In a method of charging low activity waste into an upright disposal drum having a single closure plug which is an interference fit in the drum when the closure plug occupies its closure position wherein the drum is sealed to a waste dispenser by an interposed sealing member on the drum to form a closed extension thereof, drum and dispenser closures being withdrawn in back-to-back manner into the dispenser prior to charging waste into the drum, the steps comprising compressing the interposed sealing member on the drum in two stages, a first stage of movement of the drum relative to the dispenser and prior to withdrawing the drum and dispenser closure combination into the dispenser, and, subsequent to withdrawing said combination into the dispenser, a second stage of movement of the drum relative to the dispenser sufficient to enable full interference fit engagement of the closure plug in the drum when the drum and dispenser closure combination is restored to the dispenser closed position.

4,446,064

INSULIN MEDIATOR SUBSTANCE

Joseph Larner; Kang Cheng, both of Charlottesville, Va., and Gail Galasko, Johannesburg, South Africa, assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Dec. 19, 1980, Ser. No. 218,075

Int. Cl.[3] **C07G** *7/00*

U.S. Cl. 260—112 R **10 Claims**

1. A process for producing an insulin mediator substance comprising:

contacting muscle tissue with insulin;

deproteinizing the muscle tissue;

removing the major nucleotides from the deproteinized muscle tissue;

chromatographing the so-treated product on a Sephadex G-25 column using 0.05 N formic acid; and

recovering the fraction wherein the major 230 nm absorbance peak corresponds with the ninhydrin-positive peak.

4,446,065

PHENCYCLIDINE COMPOUNDS AND ASSAYS FOR ITS DETERMINATION

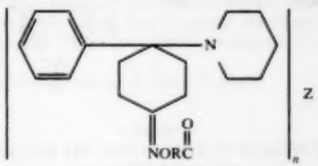
Cheng-I Lin, San Jose, and Prithipal Singh, Sunnyvale, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Dec. 22, 1981, Ser. No. 333,344

Int. Cl.[3] **C12N** *9/96;* **G01N** *33/54;* **A61K** *43/00*

U.S. Cl. 260—112 R **9 Claims**

1. A compound of the formula:



wherein:

R is a saturated aliphatic linking group of from one to six carbon atoms;

Z is hydrogen, hydroxyl, alkoxyl having from one to six carbon atoms, a group forming an activated ester capable of amine formation in an aqueous medium, or a poly(amino acid) which is antigenic or an enzyme; and

n is one when Z is other than a poly(amino acid) and otherwise is the molecular weight of Z divided by 500.

4,446,066

PROCESS FOR THE MANUFACTURE OF GLOBIN OR BLOOD CELL PROTEIN AND HEME FROM HEMOGLOBIN

Jan H. Luijerink, Berghem, Netherlands, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Jun. 15, 1982, Ser. No. 388,665

Claims priority, application Netherlands, Jun. 15, 1981, 8102856

Int. Cl.[3] **A23J** *1/06;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 260—112 B **6 Claims**

1. In a process of preparing blood cell protein and haem in which (a) haemoglobin is contacted with a mixture of organic solvent, selected from the group consisting of methanol and a mixture of methanol and ethanol and/or water, and hydrochloric acid under turbulent conditions and (b) the dispersion obtained is separated by means of hydrocyclones into a phase rich in haem and a phase rich in blood cell protein, (c) after which the phase rich in blood cell protein thus obtained is neutralized and the blood cell protein is separated from the neutralized phase and the haem is separated from the phase rich in haem, the improvement which comprises: contacting the haemoglobin, before step (a) is carried out, with a non-acidified organic solvent, selected from the group consisting of methanol and methanol and ethanol and/or water, under turbulent conditions at a temperature of from 20° C. to 50° C.

4,446,067

AZO REACTIVE DYESTUFFS

Horst Jäger, and Klaus Wunderlich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

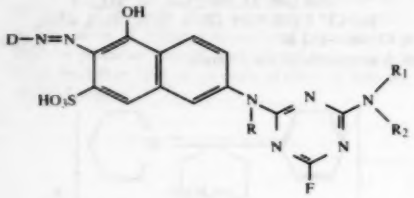
Continuation of Ser. No. 64,939, Aug. 8, 1979. This application Oct. 30, 1980, Ser. No. 202,230

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838271

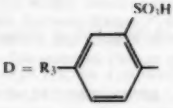
Int. Cl.³ C09B 29/00

U.S. Cl. 260—153 **8 Claims**

1. Dyestuffs of the formula



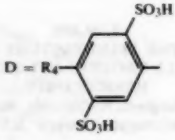
wherein



wherein

R_3 represents halogen selected from the group consisting of fluorine, chlorine and bromine; C_1–C_4-alkyl, C_1–C_4-alkoxy or a sulpho, carboxyl, acylamino or 4-sulpho-phenylazo group,

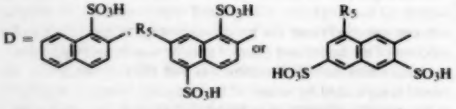
or wherein



wherein

R_4 represents hydrogen, methyl, ethyl or acylamino,

or wherein



wherein

R_5 represents hydrogen or a sulpho group,

and wherein

R = hydrogen or C_1–C_4-alkyl and

R_1 and R_2 = hydrogen, unsubstituted or substituted alkyl or cycloalkyl or

R_1 and R_2 form a ring with the nitrogen atom including a further hetero-atom.

4,446,068

N-SUBSTITUTED FLUOROAZIRIDINES AND PROCESS FOR MAKING

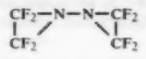
Ronald A. Mitsch, St. Paul, Minn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1967, Ser. No. 628,313

Int. Cl.³ C07D 203/22

U.S. Cl. 260—239 E **1 Claim**

1. A compound having the formula



4,446,069

PROCESS FOR THE PREPARATION OF β-LACTAM ANTIBIOTICS

Kong Luk, Horley, England, assignor to Beecham Group Limited of Beecham House, Brentford, England

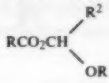
Filed Jun. 3, 1981, Ser. No. 269,897

Claims priority, application United Kingdom, Jun. 11, 1980, 8019073

Int. Cl.³ C07D 499/00, 501/04

U.S. Cl. 260—245.2 R **20 Claims**

1. A process for the preparation of a fused bicyclic β-lactam containing compound having an optionally salified free carboxylic acid group, which consists essentially of reacting an ester of the formula (I):



(I)

wherein R is a fused bicyclic β-lactam selected from the group consisting of a penicillin, penicillin derivative, carbapenem, cephalosporin, oxacephem, penam, and clavulanate derivative, wherein the carboxylic acid group is attached to the position adjacent to the nitrogen of the β-lactam ring, within the ring which is fused to the β-lactam ring; R^1 is alkyl of 1–6 carbon atoms unsubstituted or substituted by alkoxy of 1–4 carbon atoms; phenyl unsubstituted or substituted by one or more fluoro, chloro, bromo, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms or nitro or alkyl group of 1–4 carbon atoms substituted by phenyl unsubstituted or substituted by one or more fluoro, chloro, bromo, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms or nitro; and R^2 is hydrogen or alkyl of 1–4 carbon atoms or is joined to R^1 to form a tetrahydrofuranyl or tetrahydropyranyl ring, with a halide ion under neutral conditions.

4,446,070

CATALYTIC OXIDATION OF POLYNUCLEAR AROMATIC HYDROCARBONS

Derk T. A. Huibers, Pennington, and Cheng-Yih Jenq, Princeton, both of N.J., assignors to HRI, Inc., Gibbsboro, N.J.

Filed Jun. 10, 1981, Ser. No. 272,414

Int. Cl.³ C07C 50/18, 3/00

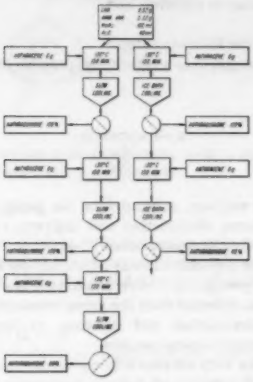
U.S. Cl. 260—369 **6 Claims**

1. A continuous process for the preparation of anthraquinone from anthracene which includes the steps of:

(a) oxidizing anthracene to anthraquinone in an oxygen-containing gas in the presence of a ceric ammonium nitrate catalyst system dissolved in an acetic acid solvent, said oxidation taking place in a series of reactors, and the reactor broth flowing from a first reactor of said series to a last reactor of said series wherein fresh ceric ammonium nitrate catalyst system is introduced;

(b) adding nitric acid to said oxidized anthracene;

(c) removing the anthraquinone from the oxidative reaction product by filtration; and



(d) recycling the filtrate remaining after the removal of the anthraquinone to catalyze the oxidation of fresh anthracene.

4,446,071

INTERMEDIATES USEFUL IN THE PREPARATION OF 17,17-BIS(SUBSTITUTED THIO) ANDROSTENES

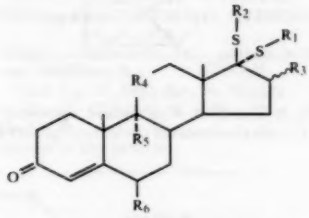
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 416,181, Sep. 9, 1982. This application May 27, 1983, Ser. No. 499,056

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.3 **7 Claims**

1. A steroid having the formula



or the 1,2-dehydro derivative thereof wherein

R_1 is alkanoyl or aroyl and R_2 is alkyl;

R_3 is hydrogen, hydroxy, alkoxy, aryloxy, oxo, methylene, alkylthio, arylthio, alkanoyl, alkanoyloxy, or halogen;

R_4 is carbonyl, β-hydroxymethylene or β-acetyloxymethylene;

R_5 is hydrogen or halogen; and

R_6 is hydrogen, methyl, hydroxy, alkanoyl or halogen.

4,446,072

PROCESS FOR DEGRADING THE 20-CARBOXYL GROUP OF Δ4-STEROID-20-CARBOXYLIC ACIDS

Wolfgang Preuss, Monheim, Fed. Rep. of Germany, assignor to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

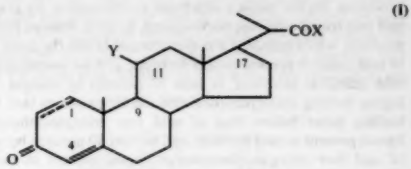
Continuation-in-part of Ser. No. 262,968, May 12, 1981, abandoned. This application Aug. 13, 1982, Ser. No. 407,751

Claims priority, application Austria, May 12, 1980, 2537/80; May 12, 1980, 2538/80

Int. Cl.³ C07J *5/00*

U.S. Cl. 260—397.45 **11 Claims**

1. A process for degrading the 20-carboxylic acid halide group of Δ4-steroid-20-carboxylic acid halides optionally containing at least one other double bond in the 1(2)- and/or 9(11)-position corresponding to formula I:



(I)

in which Y is a member selected from the group consisting of hydrogen, hydroxyl and, together with the C-atom substituted by Y, carbonyl, and a 9(11)-ene bond, and X represents a halide, characterized in that said Δ4-steroid-20-carboxylic acid halides are subjected to carboxy inversion degradation by reaction with an aromatic percarboxylic acid and hydrolysis of the reaction product under basic/alcoholic conditions and said 20-hydroxy and 20(21)-ene steroid compounds formed are recovered.

10. 20-Hydroxy-pregna-1,4-dien-3,11-dione.

4,446,073

PROCESS FOR THE REDUCTION OF UNSATURATED CARBOXYLIC ACIDS

Gail M. Qualeatti, Palatine, and Dalia Germanas, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 5, 1981, Ser. No. 290,120

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C11C *3/12*

U.S. Cl. 260—409 **11 Claims**

1. A process for the reduction of an unsaturated carboxylic acid which comprises treating said acid in a reaction system in the presence of hydrogen and a reduction catalyst comprising cadmium and ruthenium-containing compounds, wherein said cadmium and ruthenium are present in a low valence oxidation state in an amount in the range of from about 1.0 to about 10.0 wt% cadmium and from about 0.1 to about 2.0 wt% ruthenium, composited on a solid support at a temperature in the range of from about 100° C. to about 500° C. and a pressure in the range of from about 100 to about 5000 lbs./sq. in., continuously bleeding said hydrogen from said system during the reaction period, and recovering the resultant unsaturated product.

4,446,074

PREPARATION OF RHODIUM COMPLEX COMPOUNDS

Jackie D. Jamerson; Ernst Billig, both of Charleston, and David R. Bryant, South Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 24, 1981, Ser. No. 334,198

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **15 Claims**

1. An organic one-phase process for preparing a hydridocarbonyltris(triorganophosphorus) rhodium compound which comprises reacting, at a temperature of from about 20° C. to about 120° C., an essentially non-aqueous homogeneous organic reaction solution consisting essentially of (a) a rhodium complex concentrate, (b) hydrogen gas or as a source of hydrogen an alkali metal or alkali earth metal hydroxide, (c) an alcoholic diluent containing from 1 to 10 carbon atoms, (d) carbon monoxide gas or a carbon monoxide source and (e) free triorganophosphorus ligand, for at least a sufficient period of time to form said hydridocarbonyltris(triorganophosphorus) rhodium compound; said rhodium complex concentrate consisting essentially of from about 0.1 to about 30 percent by

weight of a spent hydroformylation reaction medium and having been produced by concentrating a spent hydroformylation reaction medium that contains a partially deactivated soluble rhodium complex hydroformylation catalyst, aldehyde products, higher boiling aldehyde condensation by-products, and free triorganophosphorus ligand, so as to remove from said medium, while retaining a major amount of the rhodium values of said catalyst present in said medium, at least essentially all of said aldehyde products, at least 50 percent by weight of said higher boiling aldehyde condensation by-products that have a boiling point below that of said free triorganophosphorus ligand present in said medium and at least 50 percent by weight of said free triorganophosphorus ligand present in said medium.

4,446,075

SUBSTITUTED BROMOFLUOROBENZENE DERIVATIVES AND PROCESS FOR ITS MANUFACTURE

Kurt Eiglmeier, Seelze, and Reinhard Knieps, Hanover, both of Fed. Rep. of Germany, assignors to Riedel-de Haen AG, Seelze, Fed. Rep. of Germany

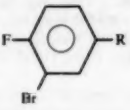
Filed Feb. 20, 1981, Ser. No. 236,546

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006685

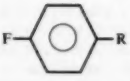
Int. Cl.[3] **C07C** *120/00, 47/55*

U.S. Cl. 260—465 G **6 Claims**

1. A process for the manufacture of a substituted bromofluorobenzene of the formula



wherein R is a cyano or COR^1 group, with R^1 being a hydrogen atom or a lower alkyl or an aryl group, which comprises subjecting a substituted fluorobenzene of the formula



wherein R has the above-mentioned meaning, at a temperature of 20° to 200° C., to direct bromination with bromine in an amount of 0.9 to 1.3 mols per mol of said fluorobenzene in the presence of 0.02 to 0.3 mols of iodine or of 0.02 to 0.3 mols of a trivalent metal or of 1 to 1.2 mols of a halide of a trivalent metal, in each case per mol of said fluorobenzene.

4,446,076

METHOD OF PREPARING 1,2-DIBROMO-2-CYANO-(SUBSTITUTED)-ALKANE ANTIMICROBIAL COMPOUNDS

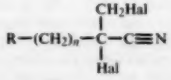
Marshall R. Angeles, Scotchplains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1981, Ser. No. 333,274

Int. Cl.[3] **C07C** *120/00, 121/16, 121/46, 121/66*

U.S. Cl. 260—465 G **1 Claim**

1. A method of preparing compounds of the formula:



(I.)

where

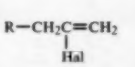
R is selected from the group consisting of C_{1-8}alkyl, straight or branched chain or phenyl;

Hal is bromine or chlorine; and

n is 1;

comprising the following steps:

(1) adding to magnesium a substituted propene of the formula:



in a solvent medium, selected from the group consisting of tetrahydrofuran, diethylether and diglyme, to form 3-(R-substituted)-2-(magnesium halide)-1-propene;

(2) reacting the 3-(R-substituted)-2-(magnesium halide)-1-propene with cyanogen in a reverse addition reaction in a solvent medium, selected from the group consisting of tetrahydrofuran, diethylether and diglyme, to form 3-(R-substituted)-2-cyano-1-propene; and

(3) halogenating with substantially equimolar amount of halogen the 3-(R-substituted)-2-cyano-1-propene to form the desired product.

4,446,077

SUBSTITUTED-CYCLOPROPYL SULFONES

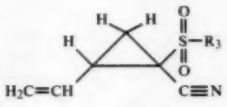
Richard G. Fayter, Jr., Fairfield, and Allen L. Hall, Amelia, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,875

Int. Cl.[3] **C07C** *121/48, 121/66*

U.S. Cl. 260—465 K **2 Claims**

1. A compound of the formula



wherein R_3 is C_{1-8} alkyl, C_{3-8} alkenyl, cyclohexyl, phenyl, benzyl or C_{1-4} alkyl-substituted cyclohexyl, phenyl or benzyl.

4,446,078

PROCESS FOR THE PREPARATION OF α,α-DIFLUOROALKYL-THIOPHENYL KETONES

Michel Desbois, Rillieux, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

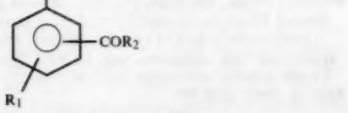
Filed Jun. 28, 1982, Ser. No. 393,121

Claims priority, application France, Jan. 21, 1982, 82 00876

Int. Cl.[3] **C07C** *121/75, 45/45, 149/30*

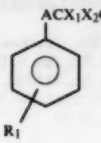
U.S. Cl. 260—465 F **9 Claims**

1. A process for the preparation of α,α-di-fluoroalkoxy or α,α-difluoroalkylthiophenyl ketones having the formula:



(I)

said process comprising reacting a polyhaloalkoxybenzene or a polyhaloalkylthiobenzene having the formula:



(II)

in a reaction vessel with a carboxylic acid, a derivative, or a precursor thereof having the formula:

(III)

in the presence of boron trifluoride in an amount such that the absolute pressure of the boron trifluoride within the reaction vessel exceeds 1 bar, and in the presence of hydrofluoric acid as a solvent;

wherein

A represents O or S;

X_1 and X_2 are identical or different and represent Cl, Br, I, or F;

X_3, X_4, and X_5 are identical or different and represent H, Cl, Br, I, or F;

X_6 represents halogen, a group derived from the anion of an inorganic acid, OH, OR_3, $OCOR_4$, NH_2, NHR_5, or NR_6R_7, wherein each of R_3, R_4, R_5, R_6, and R_7 is an aromatic or aliphatic radical;

n is zero or an integer equal to or less than 5;

R_1 represents at least one element or moiety selected from hydrogen, OH, Cl, Br, I, F, alkyl and alkoxy radicals having from 1 to 6 carbon atoms, and phenyl and phenoxy radicals substituted by at least one group more deactivating than the $ACX_1X_2C_nX_3(X_4)_n(X_5)_n$ group; and

R_2 represents an aliphatic or oromatic radical.

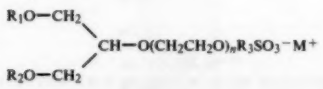
4,446,079

LOW COST, BRINE TOLERANT SULFONATE AND SULFATE SURFACTANTS HAVING 1,3-DIHYDROCARBOXY-2-PROPYL HYDROPHOBIC TAILS

Dennis H. Hoskin, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1982, Ser. No. 413,591
Int. Cl.³ C07C *143/02*; C09K *3/00*
U.S. Cl. 260—513 R **7 Claims**

1. A compound of the formula



(VI)

where R_1 and R_2 are the same or different and are C_1–C_{15} hydrocarbyl, R_3 is $C_{0\text{-}5}$ alkyl, M is a cation and n is a rational number from 2 to 6.

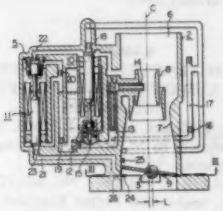
4,446,080

CARBURETOR WITH STARTING SYSTEM

Kimiji Karino; Tokuo Kosuge, and Masahiro Souma, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., both of Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,017
Claims priority, application Japan, Feb. 16, 1981, 56-20042
Int. Cl.³ F02M *5/02*
U.S. Cl. 261—39 D **6 Claims**

1. A carburetor for an engine, the carburetor comprising a main fuel system and a low-speed fuel system, characterized in that a throttle valve shaft is located in parallel to a row of cylinders of the engine disposed in side-by-side relationship substantially perpendicular to a direction of movement of a vehicle in which the engine is mounted, the carburetor is adapted to be connected to a suction manifold of the engine in such a manner that a float chamber of the carburetor is interposed between the throttle valve shaft and the row of cylinders, said throttle valve shaft is located in a position spaced apart from the axial center line of a suction conduit of said carburetor in a direction opposite to a direction in which the float chamber is located, a starting nozzle of a starting fuel system for supplying starting fuel to a suction conduit at an



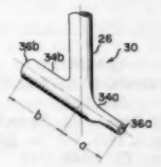
engine start-up opens downstream of a throttle valve on a side of the float chamber at which an air flow through the suction conduit is the highest, and in that said starting system comprises an idle port constituting the low-speed fuel system opening in said suction conduit adjacent said starting nozzle, and a bypass port constituting said low speed fuel system opening immediately above said idle port and upstream of said throttle valve.

4,446,081

STEAM CONDENSING APPARATUS

Mutsuhiro Arinobu, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 187,488, Sep. 16, 1980, abandoned. This application May 9, 1983, Ser. No. 490,736
Claims priority, application Japan, Sep. 21, 1979, 54-121876
Int. Cl.³ G21C *9/00*
U.S. Cl. 261—64 R **13 Claims**



1. A steam condensing apparatus comprising:

a container for holding a coolant in a liquid state;

a guide pipe having a first distal end connected through a safety valve to a source of a high pressure coolant in a gaseous state and a second distal end extending into said coolant in said container; and

a plurality of branch pipes extending from said second distal end of said guide pipe and having exhaust nozzles at the forward ends thereof, in which when said safety valve is in an inoperative state, said coolant and air in said container enter into the branch pipes and guide pipe with the air forming an upper layer and the coolant forming a lower layer, and when said safety valve is operated to permit the high pressure coolant of the gaseous state to flow into the guide pipe, said coolant and said air in the guide pipe and branch pipes and high pressure coolant of the gaseous state passed through the safety valve are ejected through the nozzles into the coolant in the container;

wherein said branch pipes are arranged in pairs, the exhaust

nozzles in each pair being spaced apart from one another by a degree sufficient to prevent a merger of bubbles formed by said ejected air in the coolant in the container and a merger of steam regions formed by said ejected coolant of the gaseous state in the coolant in the container, said steam regions forming gas-liquid interfaces where the coolant in the gaseous state condenses; and wherein

at least one of the measures including the diameter of the nozzle and length of the branch pipe being different for each of said branch pipes.

4,446,082

METHOD OF VENEERING BRICK LININGS OF FURNACES AND OTHER HIGH TEMPERATURE ENCLOSURES

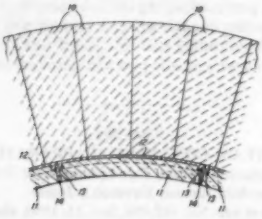
Barrie J. Harvey, Tyldesley, and Ian J. Mann, Southport, both of England, assignors to M. H. Detrick Company, Limited, Lancashire, England

Filed Feb. 9, 1982, Ser. No. 347,273

Claims priority, application United Kingdom, Feb. 9, 1981, 8103862

Int. Cl.³ C21B *7/06*

U.S. Cl. 264—30 **8 Claims**



1. A method of veneering a high temperature enclosure having a lining of refractory bricks, which method comprises the step of adhesively securing to the brick lining of a high temperature enclosure, blocks of ceramic fiber material which have been made by a vacuum-casting process such that the fibers are randomly oriented, and which have been pre-fired prior to installation.

4,446,083

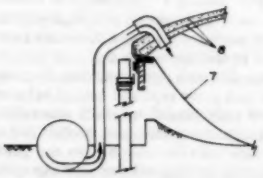
AIR-INFLATED FABRIC-REINFORCED CONCRETE SHELLS

Robert L. Nicholls, 302 Beverly Rd., Newark, Del. 19711

Filed Aug. 3, 1981, Ser. No. 289,469

Int. Cl.³ E04B *1/16*

U.S. Cl. 264—32 **1 Claim**



1. A method of constructing inflated shell enclosures in which alternate layers of a cementing matrix and a fabric reinforcing material are placed over an inflatable membrane and anchored at their common perimeter, followed by inflation of said membrane to form a shell shape, and subsequently by adding a final material component, a chemical reactant, required to harden said cementing matrix.

4,446,084

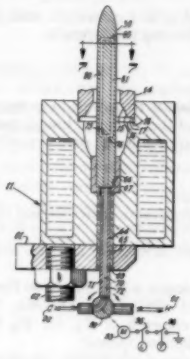
PLASTIC TUBE COUPLING AND APPARATUS FOR FORMING

William W. Rowley, 11524 Wilbert Rd., Chardon, Ohio 44024

Continuation-in-part of Ser. No. 157,395, Jun. 9, 1980, Pat. No. 4,316,870, which is a division of Ser. No. 912,743, Jun. 5, 1978, abandoned. This application Jan. 11, 1982, Ser. No. 338,303

Int. Cl.³ B29D *23/00*

U.S. Cl. 264—40.6 **26 Claims**



1. A method of reforming the end of a plastic tube between a pair of mating dies comprising the steps of controlling the temperature of a pin adapted to fit closely within the I.D. of an end of such tube independently of the temperature of the dies, placing a tube end on such pin, and then forming the tube end between the pair of mating dies to reform the tube end while maintaining the I.D. of the tube end.

4,446,085

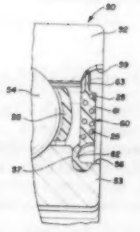
MOLDING OF SEAL RINGS

Melvin L. Earsley, 616 E. Slaton Rd., Lubbock, Tex. 79404

Filed Aug. 30, 1982, Ser. No. 412,589

Int. Cl.³ B29H *3/08*

U.S. Cl. 264—108 **8 Claims**



1. A method for fabricating a bearing seal for a frictionless bearing including the steps

designing a seal ring to have an axially thick body and to have an axially thin integral sealing lip;

designing a mold for said ring seal having at least one mold cavity for injection molding thereof;

forming said seal from an injection moldable material having dispersed particles therein with a minimum transverse dimension, which dimension is greater than the minimum thickness of said sealing lip;

introducing said injection moldable material with dispersed particles into the body portion of said mold cavity;

and effecting the setting of said moldable material to produce a ring with a molded body having embedded stiffen-

ing particles therein and with an integral sealing lip devoid of any of said stiffening particles.

4,446,086

PROCESS AND APPARATUS FOR EXTRUDING STABILIZERS

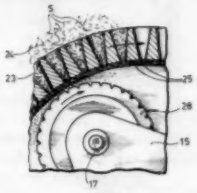
Maarten Molenaar, Schoonhoven, and Hermann A. Schreuder, Bilthoven, both of Netherlands, assignors to EnviroStrand, Inc., Leominster, Mass.

Filed Aug. 6, 1982, Ser. No. 406,048

Claims priority, application Netherlands, Oct. 30, 1981, 8104925; May 11, 1982, 8201928

Int. Cl.³ C09C 1/56

U.S. Cl. 264—118 20 Claims



1. A process for the production of a granular blend of additives for use in manufacturing plastics by mixing such additives and subsequently processing them into granules, which includes the steps of providing a quantity of additive material, providing a thin perforated die plate having tapered die openings which are larger in diameter at their inlet ends than at their outlet ends, providing at the outlet side of said die plate a perforated die support plate having openings of a larger diameter than the die openings, causing the additive material to be introduced into and extruded through the openings in the die plate and discharging the extruded material as strand-like granules through said support plate openings.

4,446,087

CONTINUOUS EXTRUSION OF PARAFFIN WAX

Philip R. Templin, Oakmont, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 22, 1981, Ser. No. 333,306

Int. Cl.³ B29C 17/00

U.S. Cl. 264—148 6 Claims

1. A method of extruding paraffin wax at a high rate into a continuous ribbon of wax of constant cross-section and good surface which comprises feeding a material consisting essentially of paraffin wax through an extrusion die at a temperature between about 2° C. below the solid state transition temperature and about 10° C. above the solid state transition temperature of said was, said paraffin wax being in the orthorhombic crystalline state during extrusion, said wax being pressured through said extrusion die at an extrusion rate of at least about ten linear feet per minute, said extrusion die defining a cross-sectional area of between about 0.5 and about 25 square inches and having its maximum dimension no greater than about ten times its small dimension, whereby a solid ribbon of wax having good surface and good die conformation is produced.

4,446,088

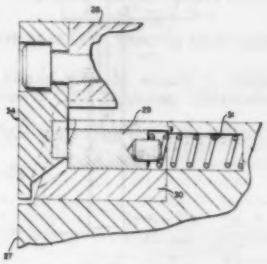
METHOD AND MOLD FOR MAKING AN IMPROVED EGG CARTON

John Daines, Rushville, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 299,683, Sep. 8, 1981. This application Sep. 23, 1982, Ser. No. 422,129

Int. Cl.³ B29D 27/00; B29C 17/03, 17/08

U.S. Cl. 264—155 2 Claims



1. A process for the production of a thermoformed thermoplastic carton comprising:

providing a relatively flat oriented sheet of polystyrene foam;

preheating said sheet to at least its forming temperature;

thermoforming said preheated sheet by bringing together a male mold member and a female mold member to form said carton including a cover having a surface which is inwardly offset with respect to the front wall of said cover;

shearing a hole in said surface while thermoforming by relative movement between a flat cutting surface of a male key mounted in said male mold member and a flat cutting surface of a female key mounted in said female mold member, said movement being parallel to the closing motion between said male and female members;

biasing said flat cutting surface of said male key against said flat cutting surface of said female key to produce shearing of said sheet between said keys; and

engaging an edge of said female cutting key with a beveled edge of said male cutting key to move said male key perpendicular to the closing motion between said male and female mold members whereby engagement between the flat surfaces of said male and female keys is obtained regardless of the alignment between said male and female mold members.

4,446,089

PROCESS AND APPARATUS FOR THE PRODUCTION OF PLASTIC STRANDS

Hugo Strehler, Frankenthal; Guenter Valentin, and Werner Hoerauf, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 461,744

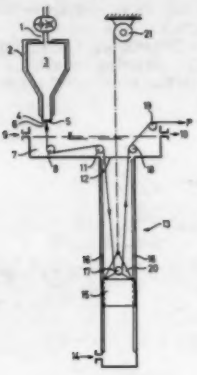
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205645

Int. Cl.³ D01D 5/08

U.S. Cl. 264—178 F 7 Claims

1. A process for the production of strands of synthetic materials, in which the viscous melt flows through die orifices, and the resulting individual strands, to be regarded as filaments, are led in counter-current to a stream of cooling water, in order to solidify them, and are then led to a further processing stage, wherein the individual melt strands are first led along a short,

essentially horizontal path for minimum solidification and thereafter are led in an essentially vertical loop of variable



length through a cooling water bath for complete solidification.

4,446,090

HIGH VISCOSITY SILICONE BLENDING PROCESS

Eric M. Lovgren, Westerlo; Joseph C. Golba, Jr., Ballston Spa, and Randall A. Reed, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,636
Int. Cl.[3] **C08K** *5/54*
U.S. Cl. 264—211 **14 Claims**

1. A method of continuously producing a thermoplastic/silicone fluid blend comprising

(a) melting a solid thermoplastic composition comprising one or more thermoplastic polymers within an extruder;

(b) injecting a high viscosity silicone fluid having a viscosity of at least 90,000 centipoise at ambient temperature into the molten thermoplastic composition within the extruder; and

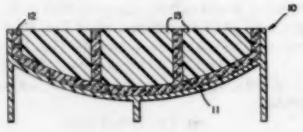
(c) blending said molten thermoplastic composition with said high viscosity silicone fluid within the extruder.

4,446,091

CARBON FIBER-REINFORCED CEMENT MOULD

Reginald D. Pairaudeau, Bristol, England, and David Turnbull, Mississauga, Canada, assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 190,830, Sep. 25, 1980, abandoned, which is a continuation of Ser. No. 954,589, Oct. 25, 1978, abandoned, which is a continuation of Ser. No. 867,122, Jan. 5, 1978, abandoned. This application Mar. 23, 1982, Ser. No. 361,105
Int. Cl.[3] **B29D** *3/02;* **B28B** *21/56;* **B29G** *7/00*
U.S. Cl. 264—225 **5 Claims**



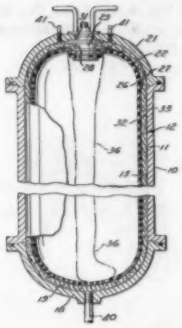
1. In a process for making and using a mold wherein a heat curable plastics composition is disposed in said mold and cured by heat, the improvement comprising: making said mold by combining carbon fibers with hydraulic cement and aggregate in the proportions of 1 to 6 parts by weight of said fibers to 100 parts by weight of said cement and aggregate and forming a coating, and mold surfaces to be in contact with said plastics composition such that said coating contains not more than 1-3 parts of carbon fibers by weight to 100 parts by weight of hydraulic cement and aggregate.

4,446,092

METHOD FOR MAKING LINED VESSELS

Ward L. Bliley, Chesterland, Ohio, assignor to Structural Fibers, Inc., Mentor, Ohio

Continuation of Ser. No. 917,939, Jun. 22, 1978, abandoned. This application Mar. 17, 1982, Ser. No. 359,045
Int. Cl.[3] **B29C** *11/00;* **B29D** *3/02*
U.S. Cl. 264—258 **6 Claims**



1. A method of making hollow fiber-reinforced resin articles having a resin-rich interior coating, comprising the steps of positic ning a hollow lay-up of loosely felted reinforcing fibers against the inner surface of a rigid mold having a cylindrical wall portion and domed end portions, positioning a stretchable polyester fiber surfacing fabric against the entire inner surfaces of the reinforcing fibers including the cylindrical wall portion and the domed end portions, venting said mold, compressing said lay-up and said surfacing fabric with an internally pressurized, inflatable core to hold the surfacing fabric in place against the hollow lay-up and to hold the hollow lay-up in place against the inner surface of the mold, injecting a metered amount of a liquid thermosetting resin in said mold, increasing the pressure in said inflatable core to compress the lay-up and to evenly distribute the resin throughout the lay-up and the surfacing fabric and to form a resin-rich coating with said surfacing fabric having a fiber-to-resin ratio less than the fiber-to-resin ratio of the resin-impregnated lay-up to form a resin-rich barrier between the interior of the tank and the reinforcing fibers in the lay-up, curing said resin, and removing the molded article from the mold.

4,446,093

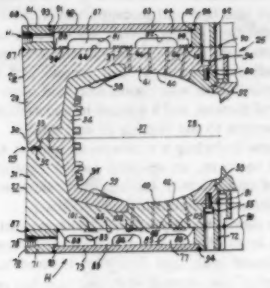
"PIGGYBACK" HEAT EXCHANGER FOR DOME PRESSES

William F. Mattson, Hinckley, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 1, 1983, Ser. No. 519,159
Int. Cl.[3] **B29H** *5/02*
U.S. Cl. 264—315 **5 Claims**

1. In a press of the steam-dome type for shaping and curing pneumatic rubber tires, said press having a fixed bottom assembly including a lower casing and a lower mold half and a movable top assembly including an upper mold half, an adjustable bolster, and an upper casing which fits the lower casing to form a seal and to provide a closed steam chamber surrounding the platen and the two mold halves, said mold halves fitting together to form a generally toroidal mold cavity and having a multiplicity of vent passages extending from said cavity to the

steam chamber, and means for supplying high pressure steam to said steam chamber, the improvement which comprises a heat exchanger having an upper section located between said supporting platen and the upper surface of the upper mold half and a lower section located between the base portion of the press and the lower surface of the lower mold half, each sec-



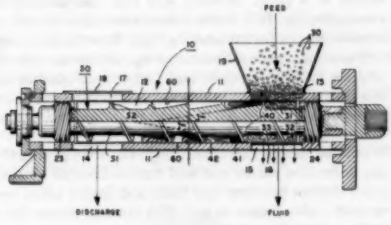
tion comprising a flat outer plate parallel to the outer face of the associated mold half and spaced therefrom by a series of narrow spacers to provide a shallow circumferential steam chamber in communication with said vent passages, and means for supplying high-pressure steam to said chamber to effect curing of a tire in the mold cavity.

4,446,094

APPARATUS AND METHOD FOR EXTRACTING FLUID FROM AN EXTRUDED MATERIAL

Paul H. Rossiter, Royersford, Pa., assignor to Welding Engineers, Inc., King of Prussia, Pa.

Filed Sep. 23, 1982, Ser. No. 421,864
Int. Cl.³ B29F *3/03*
U.S. Cl. 264—349 **12 Claims**



1. An apparatus for extracting a liquid from an elastomer comprising:

a. twin screw conveying means for screw conveying the elastomer in two side-by-side chambers in a revolving or figure-eight and forward direction;

b. means for alternately, with each rotation of the twin screw conveying means:

(i) wedging and compressing the elastomer between a forward face of a screw conveying thread, a screw shaft and a chamber wall; and

(ii) releasing the wedged and compressed elastomer;

c. means for conveying released fluid away from the wedged and compressed elastomer; and

d. means for impeding the revolving movement of the elastomer.

7. A method for extracting a liquid from an elastomer comprising:

a. twin screw conveying the elastomer in two side-by-side chambers in a revolving or figure-8 and forward direction;

b. alternately, with each rotation of the twin screw conveying means:

(i) wedging and compressing the elastomer between a forward face of a screw conveying thread, a screw shaft and a chamber wall; and

(ii) releasing the wedged and compressed elastomer;

c. conveying released fluid away from the wedged and compressed elastomer; and

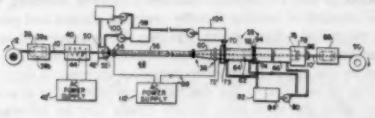
d. impeding the revolving movement of the elastomer.

4,446,095

METHOD FOR MANUFACTURING HEAT SHRINKABLE TUBING

Carlos Katz, Edison, N.J., and Amicam C. Zidon, Yorktown, N.Y., assignors to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Filed Aug. 23, 1982, Ser. No. 410,443
Int. Cl.³ B29C *13/00*
U.S. Cl. 264—558 **13 Claims**



1. A method of manufacturing long lengths of a heat-shrinkable sleeve for use in splicing electrical cables and the like, comprising the steps of

providing an elongated core and an elongated sleeve formed around the core, the core being permeable so that fluid within the core can flow along its length and can also escape from the core at a plurality of points along its length,

advancing the core and sleeve together in a generally axial direction,

hermetically seating the leading end of the advancing sleeve,

passing the core and sleeve through a heating station, thereby heating a portion of at least the sleeve,

introducing a fluid under pressure into the core, thereby internally pressurizing the sleeve to effect a radial expansion of the heated portion thereof, and

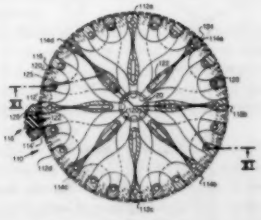
passing the core and sleeve through a cooling station, thereby cooling the expanded sleeve to stabilize it.

4,446,096

HIGH SPEED PLASMA FOCUS FUSION REACTOR

Richard C. Auchterlonie, 5701 N. Sheridan #29-q, Chicago, Ill. 60660

Filed Nov. 27, 1981, Ser. No. 325,321
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—145 **24 Claims**



1. A plasma focus fusion reactor having a reaction chamber containing material capable of fusion and having at least two electrodes, a high voltage power supply, means for receiving and storing charge supplied by the high voltage power supply,

means for conducting the charge from the means for receiving and storing the charge to the reaction chamber and having positive conductors conducting the charge to at least one of the electrodes designated as positive and negative conductors receiving the charge from at least one different electrode designated as negative and returning the charge to the means for storing the charge thereby defining a discharge circuit comprising the means for receiving and storing the charge and the reaction chamber and including a path through the reaction chamber between the positive and negative electrodes, switching means for providing a relatively high series resistance in the discharge circuit while the high voltage power supply is delivering charge to the means for receiving and storing the charge and for providing a relatively low series resistance in the discharge circuit after the means for receiving and storing the charge has received charge from the high voltage power supply, the rate of increase in the discharge current in the reaction chamber after the switching means closes and the maximum value of the discharge current being limited by the inductance associated with the discharge circuit, the discharge current in the reaction chamber ionizing said material capable of fushion thereby creating plasma and pinching the plasma at a focus point between the positive and negative electrodes and initiating fusion reactions, the total energy released by the fushion reactions being an increasing function of the rate of increase in the discharge current in the reaction chamber after the switching means closes and an increasing function of the maximum value of the discharge current, wherein the improvement comprises:

said means for conducting the charge comprises distribution circuit means, generally spherically surrounding the focus point, for conveying the discharge current so that the magnitude of the magnetic field intensity within the dielectric material and generated by the discharge current is generally proportional to the inverse square of the distance from the focus point so that the intital rate of increase in the discharge current in the reaction chamber after the switching means closes exceeds forty megaamperes per microsecond.

4,446,097

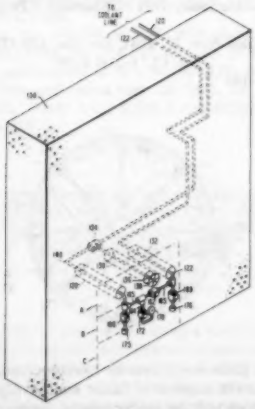
POST ACCIDENT ANALYSIS

Donald P. Calabrese, Louise La., R.D. 4, Hopewell Junction, N.Y. 12533; Matthew T. Kerns, 2 Raker Rd., Poughkeepsie, N.Y. 12603, and Dennis M. Quinn, Shadow La., R.D. 2, Hopewell Junction, N.Y. 12533

Filed Feb. 2, 1981, Ser. No. 230,623

Int. Cl.[1] **B01D** *53/30;* **G21C** *17/00*

U.S. Cl. 376—256 **1 Claim**



1. Analysis apparatus for isolating liquid and gas samples from a pressurized liquid containing dissolved gas and for determining the amount of such dissolved gas which includes:

reversible pump means having first and second ports, said pump means being operable in a forward mode to draw fluid from said first port and to discharge such fluid through said second port, in a reverse mode to draw fluid from said second port and to discharge such fluid through said first port, and in a neutral mode in which communication between said first and second ports is open;

closed gas collection means having wall means defining a gas collection zone, a first opening in said wall means into said zone adjacent the upper end thereof and a second opening through said wall means into said zone adjacent the lower end thereof, and a septum in said wall means for permitting access to the interior of said zone;

expansion means including a receiver, an inlet at the lower end of said receiver, an opening to the exterior at the upper end of said receiver and means for determining the vertical position of a liquid in said receiver;

said expansion means being positioned with said inlet below the vertical level of said pump means, said pump means being positioned with said first port located below the vertical level of said second port, and said gas collection means being positioned with said second opening located above the vertical level of said second port of said pump means;

first and second connecting means located below the vertical level of said inlet to said receiver for external connection to a sampling vessel;

first conduit means interconnecting said first sample connecting means and said first port of said pump means, first and second valve means located serially in said first conduit means for controlling fluid flow therethrough;

second conduit means interconnecting said second port of said pump means and second sample connection means, third and fourth valve means serially connected in said second conduit means for controlling fluid flow therethrough;

third conduit means interconnecting said inlet to said receiver of said expansion means and said first conduit means at a point between said first and second valve means therein, fifth valve means connected in said third conduit means for controlling fluid flow therethrough;

fourth conduit means interconnecting said second opening in said gas collecting means and said second conduit means at a point between said third and fourth valve means, sixth valve means connected in said fourth conduit means for controlling fluid flow therethrough;

fifth conduit means interconnecting said first opening to said gas collection means and said second conduit means at a point therein between said third and fourth valve means, seventh valve means in said fifth conduit means for controlling fluid flow therethrough;

vent means for connection to the exterior located at a position above the level of said second opening of said gas collection means and said second port of said pump means and above the vertical level of said fourth conduit means, sixth conduit means interconnecting said second opening of said gas collection means and said vent means including eight valve means located in said sixth conduit means for controlling fluid flow therethrough;

liquid sample delivery means having a flexible delivery tube opening at its lower end at a position below the vertical level of the first port of said pump means, seventh conduit means interconnecting said first port of said pump means and said delivery tube, and ninth valve means located in said seventh valve means for controlling fluid flow therethrough; and

waste discharge means including a discharge connection for connection to a waste cask located at a level below the vertical level of said first port of said pump means including eighth conduit means interconnecting said waste connection and said first port of said pump means and tenth

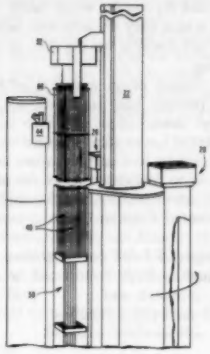
valve means in said eight conduit means for controlling fluid flow therethrough.

4,446,098

SPENT FUEL CONSOLIDATION SYSTEM

Paul Pomaibo, North Huntingdon, and Ralph W. Tolino, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,225
Int. Cl.³ G21C *19/32*
U.S. Cl. 376—261 **18 Claims**



1. Apparatus for remotely consolidating nuclear fuel rods comprising:

a vertical support;

a platform rotatably disposed around said vertical support;

a fuel assembly station attached to said platform for supporting a nuclear fuel assembly;

row ordering means arranged to accept a plurality of said fuel rods for rearranging said fuel rods into a different configuration;

first consolidation means associated with said row ordering means for compacting individual rows of said fuel rods;

second consolidation means associated with said row ordering means for compacting said fuel rods; and

a gripping mechanism slidably disposed on said vertical support and capable of gripping said fuel assembly and said fuel rods for removing said fuel rods from said fuel assembly and inserting said fuel rods in said row ordering means for closely packing said fuel rods.

4,446,099

DEVICE FOR PROTECTING CONTROL CLUSTER ACTUATING MECHANISMS DURING THE TESTING OF A NUCLEAR REACTOR

Jacques Schwind, Sucy-En-Brie, and Camille Le Feuvre, Paris, both of France, assignors to Framatome, Courbevoie, France

Filed Jul. 9, 1981, Ser. No. 281,742
Claims priority, application France, Jul. 31, 1980, 80 16881
Int. Cl.³ G21C *17/00, 9/00*
U.S. Cl. 376—277 **3 Claims**

1. A system of protecting control cluster actuating mechanisms by removing potentially harmful debris from a nuclear reactor coolant circulation system before loading the reactor with fuel assemblies and during pre-operational testing, comprising

(a) a pressure vessel having a cover secured in fluid-tight relationship therewith;

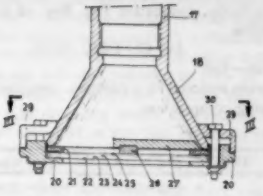
(b) a coolant inlet and outlet in said vessel for accommodating flow of coolant therethrough;

(c) spaced upper and lower core plates having coolant flow openings therein attached to support members in said pressure vessel, said upper and lower core plates providing an empty space therebetween otherwise occupied by said fuel assemblies;

(d) an upper structure mounted near the top of said pressure vessel and control rod guide tubes and support adapters mounted between said upper structure and said upper core plate;

(e) lower filter assemblies mounted on and covering the openings in said lower core plate; and

(f) upper filter assemblies removably fixed to the lower,



flared ends of tubular sheaths connecting said control cluster actuating mechanisms with the interior of said vessel, said upper filter assemblies comprising a plurality of metal gauzes covering the entire open cross section of said sheaths and having mesh calibers smaller than those of said lower filter assemblies;

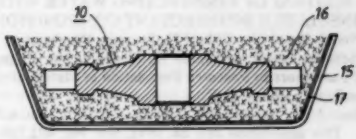
(g) whereby said upper filter assemblies prevent the flow of metal particles past said metal gauzes when a flushing liquid is circulated through said reactor during preoperational testing.

4,446,100

METHOD OF MANUFACTURING AN OBJECT OF METALLIC OR CERAMIC MATERIAL

Jan Adlerborn; Hans Larker; Bertil Mattsson, and Jan Nilsson, all of Robertsfors, Sweden, assignors to ASEA AB, Västerås, Sweden

Continuation of Ser. No. 102,336, Dec. 11, 1979, abandoned.
This application Sep. 29, 1982, Ser. No. 426,939
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—48 **7 Claims**



1. A method of manufacturing a silicon nitride object by the isostatic pressing of a body preformed of silicon nitride powder with a gaseous pressure medium while sintering said body, said method comprising:

placing said silicon nitride body and an embedding material therefor in an open top vessel which is resistant to the sintering temperature, said embedding material being in direct contact with said body and consisting of glass containing B_2O_3 or a material which forms glass containing B_2O_3 upon heating;

transforming said embedding material in the vessel into a B_2O_3 containing glass melt having a substantially horizonal upper surface limited by the walls of the vessel, said body being located beneath said surface, said melt presenting a casing that is impermeable to the gaseous pressure medium applied during said isostatic pressing, said transforming being accomplished prior to said isostatic pressing; and thereafter

isostatically pressing and sintering said body while applying

said gaseous pressure medium directly to said upper surface of said melt.

4,446,101

STORAGE MATERIAL FOR HYDROGEN

Otto Bernauer, Weinstadt, and Klaus Ziegler, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,932

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139368

Int. Cl.[3] **C22C** *30/00*

U.S. Cl. 420—424 **2 Claims**

1. A storage material for hydrogen, comprising an alloy with the following composition:

$Ti(V_{1-a-b}Fe_aAl_b)_xCr_yMn_{2-x-y}$ wherein:
x = greater than 1, but less than 2
y = 0 to approximately 0.2
x + y = not greater than 2
a = 0 to approximately 0.25
b = 0 to approximately 0.33
a + b = not greater than approximately 0.35
(1 − a − b) · x = not less than 1.

4,446,102

YELLOW GOLD JEWELRY ALLOY

Randy L. Bales, 267 Lookwood Ave., Hamilton, Ohio 45011

Filed Jan. 27, 1982, Ser. No. 343,102

Int. Cl.[3] **C22D** *5/02*

U.S. Cl. 420—507 **7 Claims**

1. A yellow gold metal alloy of less than about 6 karats having good tarnish and corrosion resistance, good workability and castability and a color, luster, shine and hue characteristic of at least 10 karat yellow gold consistinyg essentially of, by weight, about 17 to 25% gold, 10 to 27% silver, 40 to 60% copper, and 3 to 12% zinc.

4,446,103

METHOD OF DISINFECTING WATER WITH INSOLUBLE DISINFECTANT COMPOSITIONS

Ron Nudel, Brooklyn; Gilbert E. Janauer, Binghamton; Eugene E. Schrier, Vestal, and Ilona W. Figura, White Plains, all of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Division of Ser. No. 117,062, Jan. 31, 1982, Pat. No. 4,349,646. This application Jul. 28, 1982, Ser. No. 402,720

Int. Cl.[3] **A01N** *00/00*

U.S. Cl. 422—37 **9 Claims**

1. A method of disinfecting water which comprises contacting the water to be disinfected with a water insoluble disinfectant composition comprising a quaternary ammonium salt of the formula:

$$[[Z\text{—}Q]]^{(+)a}\left(X_{\frac{a}{n}}\right)^{(-)n}$$

wherein

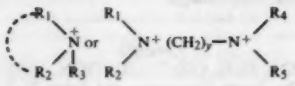
a is a positive integer,

n is an integer of 1–6,

Q is a water insoluble crosslinked resin of microporous or macroporous structure selected from the group consisting of polystyrene resins having methylene moieties attached to the backbone thereof, and methylated poly methyl acrylate resins,

X is the anion of any physiologically acceptable salts, and

Z is



wherein:

R_1 and R_2 are selected from the group consisting of straight or branch chain lower alkyl of one to eight carbon atoms, straight or branch chain lower alkenyl of two to eight carbon atoms, lower cycloalkyl of three to six carbon atoms and R_3, and R_1 and R_2 when taken together with the nitrogen to which they are attached, form a saturated or unsaturated heterocycle having five to seven carbon atoms in the ring,

R_3 is straight or branch chain midalkyl of ten to sixteen carbon atoms, phenyl, halo or lower alkyl substituted phenyl naphthyl lower alkyl and halo or lower alkyl substituted naphthyl lower alkyl wherein said lower alkyl moieties are of one to five carbon atoms and are substituted on from one to five positions on the phenyl nucleus and from one to seven positions on the naphthyl nucleus,

R_4 and R_5 are selected from the same group of values as R_1–R_3,

y is a positive integer of 1–20, provided that where R_1, N, and R_2 are joined to form a saturated or a unsaturated heterocycle, R_3 is absent, and

Z is bonded to the methylene moieties.

4,446,104

APPARATUS FOR TRANSFERRING SAMPLE VESSELS INTO COLLECTING VESSELS

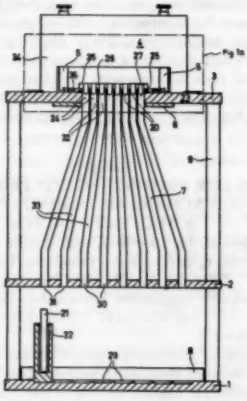
Günter Hämmerling, Heidelburg; Ingo Müller, Meckesheim, and Erich Menger, Walldorf, all of Fed. Rep. of Germany, assignors to Deutsches Krebsforschungszentrum, Heidelberg, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,305

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047265

Int. Cl.[3] **G01N** *35/04;* **B65G** *47/26;* **B01L** *3/00*

U.S. Cl. 422—63 **6 Claims**



1. A device for transferring sample vessels permanently connected to a microtiter plate to collecting vessels which are carried in cassettes and are dimensioned to accommodate such sample vessels, comprising:

(a) a table provided with a distributor plate for receiving and supporting such microtiter plate and which is provided with openings corresponding in number to the number of such sample vessels, each opening being located to lie

below a respective one of such sample vessels when such microtiter plate is supported by said distributor plate;

(b) an intermediate plate disposed below said distributor plate and provided with a plurality of openings equal in number to said openings in said distributor plate and each associated with a respective distributor plate opening;

(c) means defining a distributor system extending between said distributor plate and said intermediate plate for transferring a respective sample vessel from each distributor plate opening to its associated intermediate plate opening;

(d) a base plate disposed below said intermediate plate for the orderly accommodation of such cassettes in a manner such that each collecting vessel is located below a respective intermediate plate opening;

(e) guide means mounted on said table; and

(f) a cutting device which can be moved relative to such microtiter plate, when such microtiter plate is supported by said distributor plate, while being guided by said guide means, for severing such sample vessels from such microtiter plate.

4,446,105
SYSTEM FOR ANALYZING COAL LIQUEFACTION PRODUCTS

Stanley R. Dinsmore, Norris, and John E. Mrochek, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,782
Int. Cl.³ G01N *31/08*
U.S. Cl. 422—70 **4 Claims**

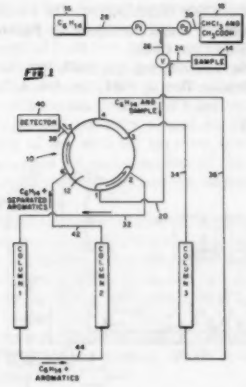


FIG. 1

1. A system for analyzing components of a liquid sample containing a plurality of both aromatic and polar hydrocarbons, comprising:

detecting means for identifying said aromatic and polar hydrocarbons;

a first column containing a first adsorbent which adsorbs said aromatic and polar hydrocarbons;

a second column containing a second adsorbent which adsorbs said aromatic hydrocarbons;

a third column containing a third adsorbent which adsorbs said polar hydrocarbons, said first, second and third adsorbents differing chemically from one another,

means for introducing said sample into said first column, whereupon said aromatic and polar hydrocarbons therein are adsorbed on said first adsorbent;

means defining and providing a source of first eluent capable of differentially desorbing said aromatic hydrocarbons from said first and second adsorbents;

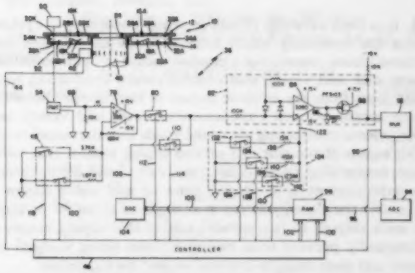
means defining and providing a source of second eluent capable of collectively desorbing said polar hydrocarbons from said first adsorbent and differentially adsorbing said polar hydrocarbons from said third adsorbent; and

flow control means for (1) passing a first stream of said first eluent through said first column and thence through said second column and to said detecting means, whereupon the aromatic hydrocarbons are differentially desorbed from said first and second adsorbents and thereby separated in said first stream before passing to said detecting means, while said polar hydrocarbons remain on said first adsorbent, and (2) subsequentially forming and passing a gradient stream comprising a gradually decreasing quantity of said first eluent and a gradually increasing quantity of said second eluent in the reverse direction through said first and second columns, relative to flow of said first stream therethrough, and thence through said third column and to said detecting means, whereupon the polar hydrocarbons adsorbed on said first adsorbent are collectively desorbed therefrom into said second stream and transferred therein to said third column and there differentially desorbed from said third adsorbent and thereby separated in said gradient stream before passing to said detecting means.

4,446,106
ANALYSIS SYSTEM

Larry A. Nelson, and Leon W. Schmidt, both of Spokane, Wash., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Jan. 15, 1982, Ser. No. 339,331
Int. Cl.³ G01N *9/30, 35/00*
U.S. Cl. 422—72 **9 Claims**



1. A chemical analysis system for analyzing a plurality of independent specimens that have time varying characteristics comprising:

a plurality of analysis regions, each said analysis region adapted to hold a corresponding specimen,

scanning means including a sensor for producing an analysis signal having a value proportional to a characteristic of the specimen in an analysis region, and means for causing sequential and repetitive sensing of said analysis regions by said sensor to produce analysis signals having values corresponding to the monitored specimen characteristics in the several analysis regions,

memory means for storing data values in locations corresponding to the analysis regions from which these data values were provided,

a signal transmission channel for applying data value signals to said memory means, said signal transmission channel including temporary signal storage means and variable response circuitry having a fast response mode and a slower response mode, and

control means connected to said variable response circuitry and operative during a first portion of an analysis region sensing interval for concurrently placing said variable response circuitry in said fast response mode and connecting said memory means to the imput of said signal trans-

mission channel to preset said temporary signal storage means to a data signal value from that analysis region that has been previously stored in said memory means,

and operative during a second portion of said analysis region sensing interval for concurrently placing said variable response circuitry in said slower response mode and connecting said sensor to said signal transmission channel to adjust the data signal value in said temporary signal storage means to the current analysis signal value provided by said sensor, and

means for transferring said adjusted data signal value from said temporary signal storage means to a location in said memory means corresponding to that analysis region.

4,446,107

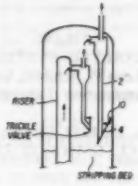
IMPROVED FCC VESSEL AND CYCLONE APPARATUS

Frank M. Buyan, Yardley, Pa., and James H. Haddad, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 26, 1982, Ser. No. 382,334

Int. Cl.³ B01J *8/26;* **C10G** *13/18;* **B01D** *45/12*

U.S. Cl. 422—107 **9 Claims**



1. In a fluid catalytic cracking vessel containing a cyclone means for separating solids from a solids-gas mixture, said cyclone means comprising a conduit means in open communication with said vessel, said conduit means conducting separated gases from the cyclone means to the outside thereof, a dipleg means in open communication with said vessel, said dipleg means conducting separated solids into the vessel, and a valve means at the exit end of said dipleg means, said valve means comprising a plate closing said exit of said dipleg means, the improvement wherein the plate of said valve means is inclined in the closed position at an angle of about 30° to about 60° with respect to the vertical axis of said dipleg means to substantially prevent solid materials from being wedged between said plate and the exit end of said dipleg means.

4,446,108

CARBON BLACK MANUFACTURE

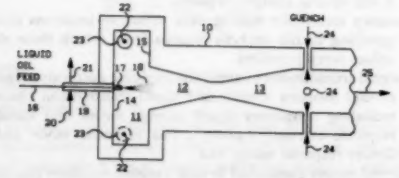
Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 197,455, Oct. 16, 1980, Pat. No. 4,339,422.

This application Feb. 24, 1982, Ser. No. 351,703

Int. Cl.³ B01J *10/00, 19/26;* **C01B** *31/02;* **C09C** *1/48*

U.S. Cl. 422—156 **4 Claims**



1. A carbon black furnace comprising a refractory lined heat insulated body having a generally cylindrical bore, said bore comprising in series

a generally cylindrical first chamber having a diameter at least about equal to its length forming a precombustion or combustion chamber,

means to introduce free oxygen-containing gas and fuel gas into said first chamber generally tangentially to the inner surface thereof to produce a vortex of combustion gases traveling axially in said cylindrical bore,

a second chamber comprising a venturi section, the length of which is greater than its throat diameter and the throat diameter of which is substantially less than that of said first chamber, said second chamber being axially aligned and communicating with said first chamber, and

injection means to introduce and direct a hydrocarbon feed generally axially along the longitudinal axis of said first chamber, said means being so constructed as to inject a solid jet liquid stream at essentially zero degree exit spray angle along the axis of said first chamber, the outlet end of said means for introducing hydrocarbon feed being positioned between the face of the upstream wall of said first chamber and the entrance to the venturi diverging section, and wherein said combustion gases and said hydrocarbon feed pass through the venturi section in a state of sufficient velocity to flow spirally inward in the combustion chamber and helically through the venturi section.

4,446,109

SYSTEM FOR DRY SCRUBBING OF FLUE GAS

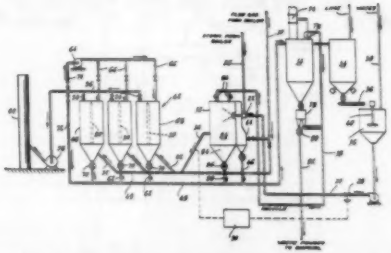
Even Bakke, Stamford, Conn., assignor to Peabody Process Systems, Inc., Stamford, Conn.

Division of Ser. No. 189,026, Sep. 22, 1980, Pat. No. 4,324,770.

This application Dec. 3, 1981, Ser. No. 327,116

Int. Cl.³ B01D *53/34*

U.S. Cl. 422—168 **2 Claims**



1. A system for dry scrubbing of flue gas containing sulfur dioxide comprising a dry scrubbing reactor, a spray dryer and a dust particle collector, means for conveying the flue gas through the spray dryer and collector, atomizing means for feeding a mist of alkali reagent to the spray dryer, means for removing particles from the dust collector, means for transporting particles to a splitter apparatus for separation into two streams, the splitter apparatus comprising a housing defining an internal compartment, partially upright wall means within the compartment dividing the compartment into a recycle particle section and a discharge particle section, means for feeding particle solids to the compartment, means for removing solid particles from the recycle section and means for removing solid particles from the discharge section, means comprising a screw feeder for feeding recycle solid particles to the dry scrubbing reactor, means for transporting one of the separated streams to the spray dryer and means for transporting the other separate stream to disposal discharge storage.

4,446,110
TREATING THE SURFACE OF ARTICLES BY ELECTRICAL BRUSH DISCHARGE

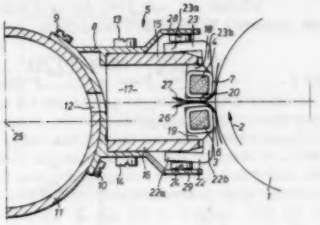
Andreas Ahlbrandt, 17 Uhlandstrasse, Lauterbach, Fed. Rep. of Germany (6420)

Filed Feb. 25, 1981, Ser. No. 237,969

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039951

Int. Cl.³ B01K *1/00*

U.S. Cl. 422—186.05 **7 Claims**



1. Apparatus for treating the surface of materials by electric brush discharge, said apparatus comprising a first electrode for guiding articles to be treated and at least one facing brush electrode having a coating, which can be connected to opposite potential and is arranged to be cooled by a cooling air flow flowing over the outside thereof, wherein guide means are provided for guiding the cooling air flow at least partly through the corona along the active discharging side of said brush electrode, and in which the brush electrode is a double electrode formed from two juxtaposed single electrodes and in which an air exhausting pipe is provided, said single electrodes forming part of a wall of said air exhausting pipe and air inlets being formed between the said brush electrodes and between said electrodes and the sides of said air exhausting pipe the cross-section of the air inlet between said brush electrodes being larger than the cross-sections of the air inlets located between the brush electrodes and the longitudinal sides of said air exhausting pipe.

2. Apparatus as claimed in claim 1, in which said air exhausting pipe has two insulators longitudinally covering the brush electrodes and further outwards in the vicinity of said single brush electrodes diaphragms made from an electrically conductive material which are spaced from said insulators and fixed to a header.

3. Apparatus as claimed in claim 2, in which said diaphragms form part of a shaped member which is open towards said brush electrodes.

4,446,111
VESSEL FOR USE IN HYDROGEN/HYDRIDE TECHNOLOGY

Clemens Halene, Dusseldorf; Karl-Ludwig Strack, Herne; Ernst Lange, Langenfeld, and Franz-Josef Henrichs, Verl, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Mannesmannufer, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,007

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3125276

Int. Cl.³ B01J *8/04, 20/06*

U.S. Cl. 422—200 **6 Claims**

1. Pressure vessel for use in hydrogen/hydride technology including storage and release of hydrogen on the basis of reaction with a solid metal or metal compound, comprising:

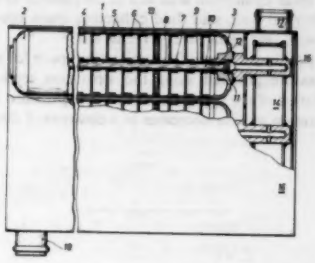
a tubular container having an inner wall and a central axis;

a gas tube disposed in and along the central axis and being continued beyond one end closure of the container, the tube having apertures; and

a plurality of bulk head like annular partitions each having a cylindrical inner flange and a cylindrical outer flange,

the partitions being arranged along the axis for compartmentizing the interior of the container and circumscribing the gas tubes;

the inner flanges tightly sitting on the gas tube, and



the outer flanges being tensioned for tightly engaging the inner wall of the container, so as to seal the several compartments as provided by the compartmentizing, the interior of the gas tube communicating with the respective compartments through the apertures.

4,446,112
APPARATUS FOR CONTACTING FLUID WITH PARTICULATE SOLID MATERIAL

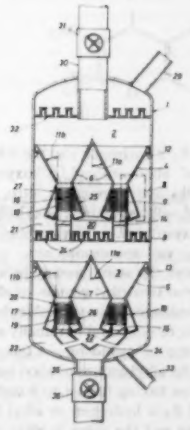
Arie P. Den Hartog, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 21, 1982, Ser. No. 380,587

Claims priority, application United Kingdom, Jul. 22, 1981, 8122652

Int. Cl.³ B01J *8/12*; C10G *35/12*

U.S. Cl. 422—216 **13 Claims**



1. An apparatus for contacting a fluid with a particulate solid comprising:

a vertical vessel having separate inlets for the fluid and solid particles disposed in the upper part of the vessel, both of said inlets communicating with a means defining a contact space located in the upper section of the vessel;

a means defining a separation section disposed in said vessel below said contact space, said separation section comprising inner and outer cylindrical walls mounted in said vessel to form an annular channel, said contact space

being connected to said annular channel by means of downwardly sloping conical surfaces;

a continuous cylindrical screen mounted in a portion of each cylindrical wall, said screen being formed by a plurality of circular rods spaced vertically to allow fluid passage and prevent passage of solid particles;

a means defining a fluid collecting space in the interior of said inner cylindrical wall and in the exterior of said outer cylindrical wall, said fluid collecting space communicating with said cylindrical screens; and

means positioned in said fluid collecting space for producing a pressure gradient along the separation section during operation of the apparatus so that said pressure along said separation section decreases in a downward direction.

4,446,113

BENZOPYRANS

John M. Evans, Roydon; Robin E. Buckingham, Welwyn Garden, and Kenneth Willcocks, Harlow, all of England, assignors to Beecham Group p.l.c., England

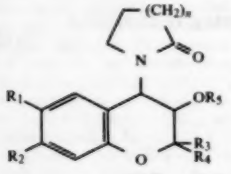
Filed Sep. 24, 1982, Ser. No. 423,450

Claims priority, application United Kingdom, Sep. 25, 1981, 8129064; Mar. 4, 1982, 8206400; Apr. 8, 1982, 8210490

Int. Cl.³ A61K *31/35, 31/33;* **C07D** *405/04, 311/68*

U.S. Cl. 422—267 **25 Claims**

1. A compound of formula (I):



(I)

wherein:

one of R_1 and R_2 is hydrogen and the other is selected from the class of alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, alkylsulphinyl, alkylsulphonyl, alkoxysulphinyl, alkoxysulphonyl, alkylcarbonylamino, alkoxycarbonylamino, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two alkyl groups, or alkylsulphinylamino, alkylsulphonylamino, alkoxysulphinylamino or alkoxysulphonylamino, or ethylenyl terminally substituted by alkylcarbonyl, nitro or cyano or —C(alkyl)NOH or —C(alkyl)NNH_2, the alkyl groups or alkyl moieties of alkyl-containing groups having from 1 to 6 carbon atoms;

one of R_3 and R_4 is hydrogen or alkyl having from 1 to 4 carbon atoms and the other is alkyl having from 1 to 4 carbon atoms, or R_3 and R_4 together with the carbon atom to which they are attached are spiroalkyl having from 3 to 6 carbon atoms;

R_5 is hydrogen, alkyl having from 1 to 3 carbon atoms or carboxylic acyl having from 1 to 8 carbon atoms; and

n is 1 or 2; the lactam group being trans to the OR_5 group.

12. A pharmaceutical composition for treatment of hypertension in mammals, which comprises an anti-hypertensive effective amount of a compound of formula (I) according to claim 1, and a pharmaceutically acceptable carrier.

4,446,114

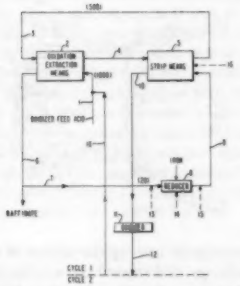
METHOD OF INCREASING THE STRIP COEFFICIENT OF THE STRIP SOLUTION STREAM IN A REDUCTIVE STRIPPING URANIUM RECOVERY OPERATION

Kenneth J. Jardine, and Robert A. Holleman, both of Lakeland, Fla., assignors to Wyoming Mineral Corporation, Lakewood, Colo.

Filed Jul. 2, 1981, Ser. No. 279,930

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **11 Claims**



1. In the method of recovering uranium from wet process phosphoric acid, where, in the first cycle, wet process phosphoric acid feed solution is passed through an extraction means to provide a uranium rich solvent stream containing dialkylphosphoric acid and trialkyl-phosphine oxide extractants, and a raffinate acid stream, wherein the uranium rich solvent stream is passed through a reductive stripping means and a portion of the raffinate acid to be used as a strip solution stream is passed through a reductive stripping means to contact the uranium rich solvent, said strip solution after exiting the reductive stripping means being oxidized and fed into a second cycle of the process to recover uranium; the improvement comprising adding sulfuric acid, at least once in the first cycle of the process, to the strip solution stream before the strip solution exits the reductive stripping means, said acid being added in an amount effective to increase the strip coefficient value of the strip solution.

4,446,115

METHOD OF RECOVERING TANTALUM FROM SILICON-CONTAINING TANTALUM SCRAP

Hiroshi Endo; Naoyuki Hirate, and Masao Tezuka, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 235,114, Feb. 17, 1981, abandoned. This application Mar. 2, 1982, Ser. No. 353,826

Claims priority, application Japan, Feb. 15, 1980, 55-16642

Int. Cl.³ C01G *35/00*

U.S. Cl. 423—63 **14 Claims**

1. A method of recovering tantalum from tantalum-containing scrap containing at least silicon and niobium as impurities to produce a recovered tantalum product containing less than about 200 ppm of silicon, consisting essentially of the steps of:

dissolving in an inorganic acid a tantalum scrap containing at least silicon and niobium to form a solution;

contacting said solution with an anionic exchange resin;

first washing said contacted exchange resin with (a) a solution of about 3 to 10 mol/l of hydrofluoric acid or (b) a solution of a strongly acidic medium comprising from about 0.01 to 0.5 mol/l of hydrofluoric acid and from about 1 to 6 mol/l of a strong acid to remove the impurities;

further washing said exchange resin with an aqueous solution of a mixture comprising hydrofluoric acid, aqueous

ammonia and an ammonium salt to produce a tantalum eluate; and

recovering tantalum from the tantalum eluate.

4,446,116

PROCESS FOR RECOVERING NIOBIUM AND/OR TANTALUM COMPOUNDS FROM SUCH ORES FURTHER CONTAINING COMPLEXES OF URANIUM, THORIUM, TITANIUM AND/OR RARE EARTH METALS

Bruno Krismer, and Axel Hoppe, both of Goslar, Fed. Rep. of Germany, assignors to Hermann C. Starck Bertin, Berlin and Uranerzbergbau-GmbH, Bonn, both of, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,275

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113335

Int. Cl.[3] **C22B** *34/24, 60/02*

U.S. Cl. 423—63 **5 Claims**

1. A process for recovering tantalum and/or niobium metal compounds from an ore containing one or more compounds of said metal or metals and further containing uranium, thorium, radium, titanium, and rare earth metals, wherein in a first step (I) the crushed ore is decomposed with a 0.5 to 6-fold amount of 70 to 96 percent sulfuric acid at elevated temperatures in the range of 200° to 350° C. for 0.5 to 3 hours with air as the oxidation agent, whereby the elements uranium, thorium and titanium are brought into solution by being converted to water soluble sulfates, the resulting solution being a solution of sulfuric acid comprising 30 to 100 grams H_2SO_4 per liter, while substantially all the transition metals remain together with radium in a water-insoluble residue, the residue then being decomposed within 6 to 20 hours in a second step (II) by leaching the residue of the first step (I) with a mixture of sulfuric acid and hydrofluoric acid at a temperature in the range of from 80° to 120° C., whereby there results a solution of transition metals wherein HF is between 8 and 30 normal and sulfuric acid is between 25 and 26 normal, and from which, by means of appropriate organic extraction agents, the transition metals are extracted as fluoro-complexes by liquid-liquid extraction, and the individual transition metals are recovered free from radioactive constituents as pure compounds in yields of more than 95 percent of the charge, while the refined products of the liquid-liquid extraction and wash water are further processed to eliminate the last traces of $RaSO_4$.

4,446,117

DOUBLE DIGESTION SYSTEM TO REDUCE FORMATION OF FERROUS IRON

James W. McDaniel, Baton Rouge, La., assignor to Alumina Development Corporation, Baton Rouge, La.

Filed Apr. 4, 1983, Ser. No. 481,821

Int. Cl.[3] **C01F** *7/06*

U.S. Cl. 423—121 **11 Claims**

1. A process to produce alumina hydrate containing less than 0.017% by weight of Fe_2O_3, which comprises:

(a) mixing a ground bauxite with a first spent caustic soda stream to form a bauxite slurry;

(b) reacting at 113° C. to 205° C. said bauxite slurry with a second spent caustic soda stream to form a first reactant product slurry comprising

(i) a first pregnant liquor stream having an alumina to NaOH weight ratio of 0.75 to 1.05,

(ii) a first granular residue stream, and

(iii) a first muddy substance stream;

(c) cooling said first reactant products slurry to 88° C. to 112° C.;

(d) removing said first granular residue stream;

(e) separating said first pregnant liquor stream from said first muddy substance stream;

(f) filtering said first pregnant liquor stream through a first paper, sand or synthetic cloth to produce a first filtrate stream having an Al_2O_3 to NaOH weight ratio of 0.75 to 1.05;

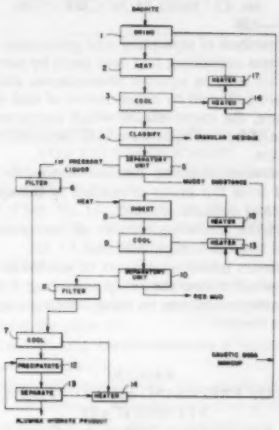
(g) reacting at 206° C. to 350° C. said first muddy substance stream with a third spent caustic stream to form a second reactant products slurry comprising:

(i) a second pregnant liquor stream having an Al_2O_3 to NaOH weight ratio of 0.75 to 1.05, and

(ii) a red mud stream;

(h) cooling said second reactant products slurry to 88° C. to 112° C.;

(i) removing said red mud stream;



(j) filtering said second pregnant liquor stream through a second paper, sand or synthetic cloth to produce a second filtrate stream having an Al_2O_3 to NaOH weight ratio of 0.75 to 1.05;

(k) combining said first and second filtrate streams and cooling same to 50° C. to 87° C.; and

(l) precipitating alumina hydrate from the cooled filtrate streams.

4,446,118

SCRUBBING HYDROGEN SULFIDE FROM A FUEL GAS

Stephen W. Nicksic, Brea, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 27, 1982, Ser. No. 382,460

Int. Cl.[3] **B01D** *53/34;* **C01B** *17/04*

U.S. Cl. 423—226 **3 Claims**

1. A method of removing hydrogen sulfide from fuel gas comprising:

contacting said fuel gas with an aqueous scrubber solution having at least 10 volume percent of a hydrogen sulfide scrubbing agent of the formula:

wherein R^1 and R^2 are substituents having between 1 and 12 carbon atoms; and

wherein said aqueous scrubber solution contains less than about 1 weight percent of a promoter comprising added organic acids having between 1 and 12 carbon atoms.

4,446,119

METHOD AND COMPOSITIONS FOR REDUCING CORROSION IN THE REMOVAL OF ACIDIC GASES FROM GASEOUS MIXTURES

Michael S. DuPart, Alvin; Billy D. Oakes, Lake Jackson, both of Tex., and David C. Cringle, Melbourne, Australia, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 224,365, Jan. 12, 1981, abandoned. This application Apr. 29, 1982, Ser. No. 372,869

Int. Cl.[3] B01D 53/34; C23F 11/06

U.S. Cl. 423—228 17 Claims

16. In the method of separating acid gases from a hydrocarbon feed stream containing said acid gases by contacting said gaseous stream with an aqueous alkanolamine solution at elevated pressure followed by regeneration of said solution at a lower pressure, the improvement which comprises inhibiting the corrosion of ferrous equipment used therein by maintaining in said solution,

(A) a corrosion inhibiting amount of soluble compounds selected from the group consisting of thiocyanate compounds, and mixtures thereof,

(B) a corrosion inhibiting amount of one or more soluble trivalent bismuth compounds, and

(C) a corrosion inhibiting amount of soluble divalent compounds selected from the group consisting of one or more nickel compounds, one or more cobalt compounds, and mixtures thereof.

4,446,120

METHOD OF PREPARING SILICON FROM SODIUM FLUOSILICATE

Frederick A. Schmidt; David Rehbein, and Premo Chiotti, all of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1982, Ser. No. 344,084

Int. Cl.[3] C01B 33/02; C30B 29/02

U.S. Cl. 423—350 10 Claims

1. A process for preparing high purity silicon from Na_2SiF_6 comprising:

heating the Na_2SiF_6 to decomposition temperature to form NaF and gaseous SiF_4, whereby most impurities remain with the NaF,

feeding the gaseous SiF_4 into the cavity of a reduction bomb containing a suitable reductant to form a reaction mixture, the reductant being in a physical form having a packing density from about 0.1 gm/cc to about 0.3 gm/cc, and being dispersed throughout the bomb cavity,

igniting the reaction mixture to react the SiF_4 with the reductant to form silicon and a slag, and

recovering the silicon.

4,446,121

MATERIAL FOR HYDROGEN ABSORPTION AND DESORPTION

Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi, and Toshio Yamashita, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 819,510, Jul. 26, 1977, Pat. No. 4,358,432. This application Apr. 22, 1982, Ser. No. 370,997

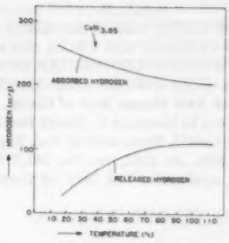
Claims priority, application Japan, Jul. 26, 1976, 51-89439; Aug. 5, 1976, 51-93643

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.[3] C01B 6/24

U.S. Cl. 423—644 6 Claims

1. Material for hydrogen absorption and desorption comprising an alloy represented by the formula AB_x in which A represents a metal comprising calcium, B represents an alloy consisting of nickel and one element selected from the group consisting of manganese, chromium, iron and copper and x is a value indicating the ration of B to A, and is between 3.8 and 6.3, the hydride of said alloy having a hydrogen dissociation equilibrium pressure of less than atmospheric pressure at room temperature and of several atmospheres at 35° to 100° C. and a hydrogen absorption capacity of more than 200 cc/g at room



temperature, said material having a single homogeneous hexagonal structure phase of the $CaCu_5$ type in more than 95% of the alloy.

4,446,122

PURIFIED HUMAN PROSTATE ANTIGEN

Tsann M. Chu; Ming C. Wang, both of Williamsville, and Lawrence Papsidero, Lackawanna, all of N.Y., assignors to Research Corporation, New York, N.Y.

PCT No. PCT/US80/01708, 371 Date Aug. 28, 1981, 102(e) Date Aug. 28, 1981, PCT Pub. No. WO81/01849, PCT Pub. Date Jul. 9, 1981

Continuation-in-part of Ser. No. 108,217, Dec. 28, 1979, abandoned. This PCT application Dec. 23, 1980, Ser. No. 316,954

Int. Cl.[3] G01N 33/56, 33/54; C12N 5/00; A61K 37/02

U.S. Cl. 424—1.1 17 Claims

1. An in vivo composition of matter comprising an immunochemically effective concentration and amount of a purified human prostate specific antigen occurring in normal and cancerous prostatic tissue and purified to show a single protein band on analytical polyacrylamide gel electrophoresis and isoelectric focusing, said antigen having a molecular weight as determined by Sephadex G-75 gel of filtration of about 33,000 and by a molecular weight as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis of about 34,000 with no subunit and having an isoelectric point pI of 6.9, said antigen further being insoluble in perchloric acid and substantially free of normal serum protein components, water-insoluble cellular material and of prostatic acid phosphatases.

16. A continuous murine cell line capable of producing monoclonal antibodies of the IgM isotype to the specific antigen of claim 1 under nutrient growth conditions, consisting essentially of a fused cell hybrid of:

(a) primed antibody-producing cells with

(b) myeloma cells capable of producing a homogenous population of immunoglobulin in the fused hybridoma.

4,446,123

PROCESS OF RADIOIMAGING THE MYOCARDIUM OF MAMMALS UTILIZING RADIOLABELED LIPOPHILIC CATIONS

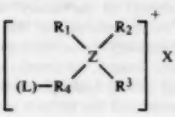
David V. Woo, Downingtown, Pa., assignor to Hahnemann University, Philadelphia, Pa.

Filed Oct. 13, 1982, Ser. No. 433,871

Int. Cl.[3] A61K 43/00, 49/00

U.S. Cl. 424—1.1 18 Claims

1. A process of imaging the myocardium of mammals consisting of intravenously injecting radiolabeled lipophilic cations of quaternary ammonium, quaternary phosphonium or quaternary arsonium compounds having the general formula



where R_1 and R_2 are alkyl or aryl groups, R_3 is a phenyl or benzyl group, R_4 is a radiolabelled phenyl or benzyl group and X is Br^-, I^- or Cl^- and where L is I^{123}, I^{125}, I^{131}, Br^{77}, Br^{82} or F^{18} and Z is nitrogen, phosphorous or arsenic, and then radioimaging the myocardium.

4,446,124

WOUND DRESSING COMPRISING SILVER SULFADIAZINE INCORPORATED IN ANIMAL TISSUE

Charles L. Fox, Jr., Saw Mill Rd., Sherman, Conn. 06784; Shanta M. Modak, 184 Howland Ave., River Edge, N.J. 07761, and Paul Fox, New York Medical College, Valhalla, N.Y. 10029

Filed Mar. 31, 1983, Ser. No. 480,687

Int. Cl.³ A61K *9/70, 35/36, 31/625*

U.S. Cl. 424—27 **9 Claims**

1. A method for preparing animal tissues for use as burn or wound dressings which comprise soaking animal tissue in an aqueous solution of ammoniated silver sulfadiazine to incorporate the ammoniated silver sulfadiazine to the animal tissue, and partially drying the thus-treated animal tissue.

4,446,125

USE OF ISOMERIC FARNESENE PRODUCT-BY-PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS, CHEWING GUMS, MEDICINAL PRODUCTS AND TOOTHPASTES

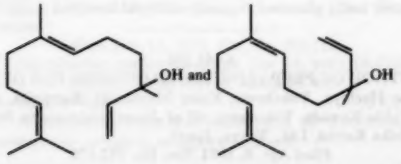
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown, both of N.J.; Bernard J. Chant, Rye, N.Y.; Anton V. Ouwerkerk, Livingston, N.J.; Venkatesh Kamath, Red Bank, N.J., and Cynthia J. Mussinan, Bricktown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 292,392, Aug. 13, 1981, Pat. No. 4,376,068. This application Jan. 27, 1983, Ser. No. 461,476

Int. Cl.³ A23L *1/226*

U.S. Cl. 424—49 **7 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuffs, chewing gums, toothpastes and medicinal products which comprises adding to said consumable material from about 0.02 ppm up to about 150 ppm based on the weight of said foodstuff of a farnesene isomer mixture produced according to the process of dehydrating a nerolidol isomer mixture containing nerolidol isomers defined according to the structures:



in the presence of a catalyst selected from the group consisting of potassium acid sulfate and paratoluene sulfonic acid at a temperature in the range of from 110° C. up to 200° C. and at a pressure in the range of from 1 mm/Hg pressure up to 200 atmospheres pressure, absolute during the reaction, simultaneously removing water of reaction from the reaction mass, and then distilling the resulting product at a temperature in the range of from 51° up to 103° C. and a pressure in the range of from 0.7 up to 2.0 mm/Hg, with the proviso that when a potassium acid sulfate catalyst is used, the temperature of reaction is in the range of 180°–200° C.; and with the further proviso that when using a paratoluene sulfonic acid catalyst, the reaction temperature is in the range of from 115° C. up to 200° C.

4,446,126

ANTITHROMBIN-HEPARIN COMPLEX AND METHOD FOR ITS PRODUCTION

Robert E. Jordan, Concord, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation of Ser. No. 192,170, Sep. 30, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,504

Int. Cl.³ A61Y *31/725, 35/14*

U.S. Cl. 424—183 **21 Claims**

1. A method for preparing a composition having as its sole effective anticoagulant agent an antithrombin-heparin complex, comprising the steps of:

(a) reversibly binding antithrombin to a lectin-containing water-insoluble matrix;

(b) contacting said matrix and said antithrombin bound thereto with heparin, whereby an active portion of said heparin complexes with said antithrombin;

(c) washing said matrix to remove portions of heparin not complexed to said antithrombin;

(d) displacing said antithrombin-heparin complex from said matrix; and

(e) thereby recovering said antithrombin-heparin complex substantially free from uncomplexed antithrombin and uncomplexed heparin.

4,446,127

PROCESS FOR THE PREPARATION OF PHARMACEUTICAL AND COSMETIC DISPERSIONS

Manfred Bücheler, Overath; Bernd Klinksiek, Bergisch-Gladbach; Hans Gehringer, Cologne, and Hildegard Schnöring, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 280,615, Jul. 6, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,336

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028005

Int. Cl.³ A61K *7/42*

U.S. Cl. 424—59 **3 Claims**

1. A process for the preparation of a fine-particled, stable, pharmaceutical or cosmetic dispersion consisting of an aqueous phase and an organic phase which is insoluble or not completely soluble in water, which comprises dispersing the entire inner phase at a temperature between 40° and 180° C. to a particle size of 0.1 to 10 μm in only 5 to 40% by volume of the outer phase for the desired finished dispersion at a temperature above the liquefaction point of the inorganic phase and of the aqueous phase, and then diluting the resulting dispersion without changing the particle size, with the remaining 60 to 95% of the outer phase, the temperature of which is below the solidification point of the inner phase, the temperature and volume ratio of said two phases being adjusted so that a reversal of phases takes place during dispersion.

4,446,128

ANTIGEN DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Gerhard Baschang, Bettingen; Felix M. Dietrich, Basel; Roland Gisler, Binningen, all of Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany; Jaroslav Stanek, Birsfelden, Switzerland, and Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

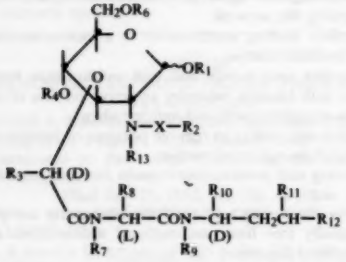
Continuation of Ser. No. 14,190, Feb. 22, 1979, abandoned. This application May 18, 1982, Ser. No. 379,404

Claims priority, application Switzerland, Feb. 24, 1978, 2035/78; Apr. 7, 1978, 3777/78; May 18, 1978, 5394/78

Int. Cl.[3] **A61K** *39/00, 37/00;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 424—88 **32 Claims**

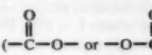
1. A novel antigen derivative, which comprises an antigen radical and one or more muramylpeptide radicals covalently bound thereto, directly or via a spacer, the antigen and muramylpeptide of those radicals each containing at least one functional group characterized in that upon reaction between antigen and muramylpeptide, antigen and spacer or muramylpeptide and spacer one of the below-mentioned covalent linking-structures is formed between the reactants, said muramylpeptide has the formula



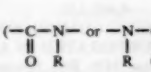
(II)

in which X is a carbonyl, carbonyloxy or sulfonyl group, R_1, R_4 and R_6 independently of one another represent hydrogen, alkyl having from 1 to 18 carbon atoms, benzyl which is unsubstituted or substituted in the aromatic nucleus by lower alkyl, hydroxyl, lower alkoxy, lower alkylenedioxy, mercapto, lower alkylmercapto, trifluoromethyl and/or halogen, or represent alkanoyl having from 2 to 18 carbon atoms, benzoyl or naphthoyl which are unsubstituted or substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl, hydroxyl or lower alkanoyloxy, or represent an acyl radical of a lower alkanesulfonic acid

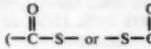
or of phenylsulfonic acid, which is unsubstituted or substituted by lower alkyl or halogen, or represent carbamoyl, lower alkyl-carbamoyl or phenyl-carbamoyl, R_2 represents alkyl having 1 to 18 carbon atoms which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylmercapto, lower alkanoylmercapto, carboxy, lower alkoxycarbonyl and/or carbamoyl, or represents phenyl which is unsubstituted or substituted by lower alkyl, hydroxy, lower alkoxy, lower alkanoyl, lower alkylenedioxy, halogen and/or trifluoromethyl, R_3, R_7, R_9 and R_{13} are independently of one another hydrogen or lower alkyl, R_8 is hydrogen, lower alkyl which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, mercapto, lower alkylmercapto, lower alkanoylmercapto, amino, lower alkanoylamino, carbamoylamino or cycloalkyl having 5 or 6 carbon atoms, or represents cycloalkyl-lower alkyl, the cycloalkyl radical of which contains 5 or 6 carbon atoms, phenyl or phenyl-lower alkyl, in which the phenyl radicals are unsubstituted or substituted as defined above, or heterocyclic radicals are 5- or 6-membered, contain one or two nitrogen atoms in the ring and may or may not contain a fused phenyl radical, R_7 and R_8 together can also represent alkylene having 3 or 4 carbon atoms, R_{10}, R_{11} and R_{12} independently of one another represent carboxyl, lower alkoxycarbonyl or carbamoyl which is unsubstituted or mono- or disubstituted at the nitrogen atom by unsubstituted or carboxy- or carbamoyl-substituted lower alkyl or by phenyl, benzyl, tetramethylene or pentamethylene and R_{11} can also be hydrogen, with the proviso that the muramylpeptide and the antigen are bonded together via the covalent linking structures carbonyloxy



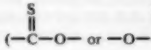
carbonylimino



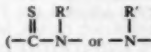
wherein R is hydrogen or lower alkyl), carbonylthio



thiocarbonyloxy



and/or thiocarbonylimino



wherein R′ is hydrogen or lower alkyl) directly or via a spacer, and with the further proviso that the antigen-muramylpeptide derivative may or may not be fixed to a high molecular weight carrier and that the antigen is not a constituent of a vaccine against tumour cells.

4,446,129

METHOD FOR TREATMENT OF ARTHROSIS DEFORMANS WITH ELASTASE

Tohru Sawada, Ibaragi, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1983, Ser. No. 529,070

Claims priority, application Japan, Sep. 17, 1982, 57-160837

Int. Cl.[3] **A61K** *37/48*

U.S. Cl. 424—94 **10 Claims**

1. A method for treating a subject suffering from arthrosis deformans which comprises administering to said subject a therapeutically effective amount of a composition comprising elastase and a pharmacologically acceptable carrier.

4,446,130

METHOD OF PREPARING DRIED GINSENG FOR DRUG

Iwao Hachiya, Yokohama; Keizo Mochizuki, Kawasaki, and Yukio Kuwada, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 252,175

Claims priority, application Japan, Apr. 18, 1980, 55-50361

Int. Cl.[3] **A61K** *35/78*

U.S. Cl. 424—195 **5 Claims**

1. A method for dehydrating the raw root of a ginseng plant, which comprises the consecutive steps of:

(a) heating the raw ginseng root which has been packed in a sealed bag or container, at a temperature of 60°–100° C. until the tissue of the ginseng root has been softened to a

hardness of from half to one tenth of the original hardness of the raw ginseng root as measured by a penetrometer,

(b) freezing the ginseng root so softened and then unpacked, in an inert gas which is under a gas pressure of 20–70 kg/cm^2, and

(c) freeze-drying the pressure-frozen ginseng root in vacuo.

4,446,131

CONTROLLED TEMPERATURE PROCESS FOR MANUFACTURING OF IMPROVED STABILIZED ALOE VERA

Rex G. Maughan, Tempe, Ariz., assignor to Aloe Vera of America, Inc., Dallas, Tex.

Filed Jun. 9, 1982, Ser. No. 386,702

Int. Cl.^{3} A61K *35/78*; C07G *17/00*

U.S. Cl. 424—195 **8 Claims**

1. A process for stabilizing a clear gel which has been separated from the leaf of aloe vera comprising:

(a) heating said aloe vera gel to a temperature in the range of from about 35° C. to about 70° C.;

(b) adding to said heated aloe vera gel ascorbic acid in an amount from about 0.05% to 0.5% based on the weight of said gel;

(c) maintaining the admixed aloe vera gel and ascorbic acid at a temperature in the range of from about 35° C. to about 70° C. for a sufficient period of time to kill bacteria; and

(d) cooling the aloe vera gel to ambient temperature or lower in less than one hour.

4,446,132

NONTOXIC ASPIRIN COMPOSITION

Audrey L. Bender, Huntington Valley, Pa., assignor to Dynatech Laboratories Incorporated, Alexandria, Va.

Filed Mar. 11, 1982, Ser. No. 357,074

Int. Cl.^{3} A61K *31/61, 31/615*

U.S. Cl. 424—233 **7 Claims**

1. A method of treating headaches and other disorders normally treated with aspirin, comprising the steps of providing an admixture comprising acetylsalicylic acid and glycine in water-free dosage form in which the glycine is unreacted with said acid, and orally administering the dosage form of said admixture while the glycine is still unreacted with said acid, the unreacted glycine in the administered admixture being present in an amount sufficient to suppress the in vivo breakdown of said acid in the acidic environment of the human stomach without substantially impairing the therapeutic effect of the acetylsalicylic acid.

4,446,133

1-PHENYL-4-CARBAMOYL PIPERAZINE COMPOUNDS, PROCESS FOR PREPARATION THEREOF AND UTILIZATIONS THEREOF

Yutaka Okazaki; Hiroshi Tokuda, both of Chiba; Shiyoichiro Miyahara, and Yoshitsugu Yamada, both of Fukuoka, all of Japan, assignors to Misuitoatsu Chemicals, Inc., Tokyo, Japan

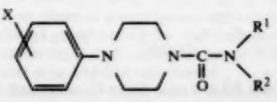
Filed Feb. 13, 1981, Ser. No. 235,112

Claims priority, application Japan, Feb. 15, 1980, 55-016561

Int. Cl.^{3} C07D *241/04*; A61K *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A piperazine compound represented by the following formula or its inorganic or oganic acid salt:



wherein X stands for a carboxy or alkoxycarbonyl group, R^1 stands for a hydrogen atom or an alkyl group, and R^2 stands for a hydrogen atom or an alkyl group.

4,446,134

PROCESS FOR HEAT TREATMENT OF AQUEOUS SOLUTION CONTAINING HUMAN BLOOD COAGULATION FACTOR VIII

Ryoichi Naito, Ibaraki; Tadakazu Suyama, Kyoto, and Yoshiro Iga, Nishinomiya, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Feb. 19, 1982, Ser. No. 350,150

Claims priority, application Japan, Oct. 28, 1981, 56-173585

Int. Cl.^{3} A61K *35/14*

U.S. Cl. 424—101 **12 Claims**

1. A process for heat treatment to inactivate the hepatitis virus in a human blood coagulation factor VIII composition, which comprises carrying out the heat treatment at 50° to 80° C. of an aqueous solution containing the human blood coagulation factor VIII for a time sufficient to inactivate the hepatitis virus but to retain the activity of the blood coagulation factor VIII, said heat treatment conducted in the presence of 10% (W/V) or more of at least one principal stabilizer selected from the group consisting of neutral amino acids, monosaccharides, oligosaccharides, and sugar alcohols and 10% (W/V) or more of at least one auxiliary stabilizer selected from the group consisting of salts of hydrocarbon carboxylic acids and hydroxhydrocarbon carboxylic acids, which have 3 to 10 carbon atoms.

4,446,135

CHEWABLE ANTACID TABLETS

Harvey A. Fountaine, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,913

Int. Cl.^{3} A61K *33/06, 33/08, 33/10*

U.S. Cl. 424—154 **5 Claims**

1. In a method of imparting good "mouthfeel" in chewable antacid tablets, said good "mouthfeel" being characterized by a non-chalky, non-gritty texture, said tablets being prepared from a primary granulation of tablet ingredients comprising from 45 to 50 weight percent of calcium carbonate and from 8 to 11 weight percent of magnesium hydroxide, as the effective antacid ingredients, along with from 30 to 40 weight percent of sucrose and from 8 to 11 weight percent of mannitol, said primary granulation, together with a flavoring agent and a tablet lubricating agent, being pressed into said chewable tablets, the improvement which comprises use of calcium carbonate having an average particle diameter from 5 to 50 microns to impart said good "mouthfeel" to said chewable tablets.

4,446,136

AGENTS FOR IMPROVEMENT OF PERIPHERAL BLOOD FLOW

Hiroshi Maeda, and Katsuhide Nishi, both of Kumamoto, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,943

Claims priority, application Japan, Sep. 25, 1980, 55-132336

Int. Cl.^{3} A61K *37/12*

U.S. Cl. 424—177 **17 Claims**

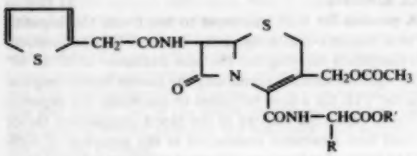
1. A method of improving the peripheral blood flow in a warm blooded animal comprising administering to said warm blooded animal by injection an effective amount of a composition comprising an active agent selected from the group consisting of gelatin and solubilized collagen, and a pharmaceutically acceptable carrier.

4,446,137
CEPHALOSPORIN DERIVATIVE AND PHARMACEUTICAL COMPOSITION CONTAINING THE DERIVATIVE

Shigeaki Muto, Tokyo; Kouichi Niimura, Sayama; Takao Ando, Tokyo; Masahiko Fujii, Komae; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

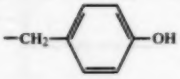
Filed Sep. 16, 1982, Ser. No. 419,076
Claims priority, application Japan, Sep. 18, 1981, 56-147578
Int. Cl.³ A61K *31/545;* **C07D** *501/34*
U.S. Cl. 424—246 **10 Claims**

1. A cephalosporin derivative having the general formula (I);



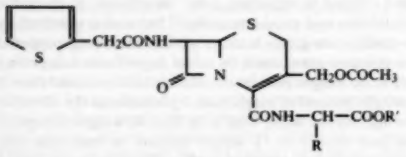
(I)

wherein R′ is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkali metal and R is $-CH_2COOR'$, $-CH_2CH_2SR'$,



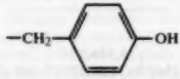
or $-CH_2CH_2COOR'$ wherein R′ is defined above.

6. A pharmaceutical composition in dosage unit form which comprises a dosage amount effective for the treatment of an infectious disease due to bacteria, of a cephalosporin derivative having the general formula (I);



(I)

wherein R′ is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkali metal and R is $-CH_2COOR'$, $-CH_2CH_2SR'$,



or $-CH_2CH_2COOR'$ wherein R′ is defined above, and a carrier, diluent or adjuvant therefor.

4,446,138
METHOD AND COMPOSITION FOR REDUCING WEIGHT

Howard M. Pack, 12 Herkimer Rd., Scarsdale, N.Y. 10583

Filed Feb. 10, 1982, Ser. No. 347,492
Int. Cl.³ A61K *27/00*
U.S. Cl. 424—248.57 **8 Claims**

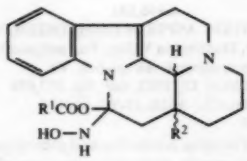
1. A composition for use in the treatment of obesity comprising L-Dopa, a decarboxylase inhibitor in amounts of between about 6% and about 100% by weight of said L-Dopa, and Molindone in amounts of between 1.0 and 50 weight percent of said L-Dopa.

4,446,139
HEXAHYDROINDOLOQUINOLIZINIUM AND OCTAHYDROINDOLOQUINOLIZINE ESTERS, AND METHOD OF INCREASING BLOOD FLOW IN AN ANIMAL WITH HYDROXYAMINO-EBURNANE DERIVATIVES

Csaba Szantay; Lajos Szbao; György Kalaus; Janos Sapi; Lajos Dancsi, Tibor Keve, and Maria Gazdag, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Division of Ser. No. 154,329, May 29, 1980, Pat. No. 4,345,082.
This application Feb. 23, 1982, Ser. No. 351,506
Claims priority, application Hungary, May 31, 1979, RI 713
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ A61K *31/435;* **C07D** *455/00*
U.S. Cl. 424—256 **10 Claims**

1. A method of increasing blood flow in an animal which comprises the step of administering to the animal a pharmaceutically effective amount of a compound of the formula (I)

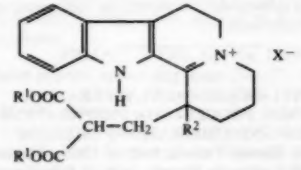


(I)

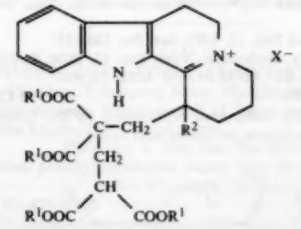
wherein

R^1 and R^2 are each C_1 to C_6 alkyl or a pharmaceutically acceptable acid addition salt thereof.

8. A pharmaceutically acceptable acid addition salt of the formula (IVa) or (IVb)



(IVa)



(IVb)

wherein R^1 and R^2 are each C_1 to C_6 alkyl and X is an acid residue, or a corresponding free base or an optically active isomer thereof.

4,446,140

METHOD AND COMPOSITION FOR TREATING MOUTH PAIN

Eric L. Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation-in-part of Ser. No. 329,550, Dec. 10, 1981, which is a continuation of Ser. No. 140,493, Apr. 15, 1980, Pat. No. 4,316,888. This application Mar. 29, 1982, Ser. No. 362,933

Int. Cl.[3] A61K *31/485*

U.S. Cl. 424—260 6 Claims

1. A method of temporarily reducing pain and discomfort associated with mouth pain comprising administering to a human having mouth pain an effective mouth pain reducing amount of dextromethorphan or a pharmaceutically acceptable salt thereof.

4,446,141

HYPOTENSIVE PIPERIDINE DERIVATIVES

Nobuhiro Nakamizo, 1704-22, Honmachida, Machida-shi, Tokyo, 194; Hiroyuki Obase, 9-9, Naka-machi 3-chome, Machida-shi, Tokyo, 194; Kazuhiro Kubo, 625-11, Kashiwakubo, Shuzenji-machi, Tagata-gun, Shizuoka, 410-24, and Yutaka Kasuya, 1-61, Komukainishi-machi, Saiwai-ku, Kawasaki-shi, Kanagawa, 210, all of Japan

PCT No. PCT/JP79/00141, 371 Date Feb. 2, 1980, 102(e) Date Jan. 31, 1980, PCT Pub. No. WO80/00024, PCT Pub. Date Jan. 10, 1980

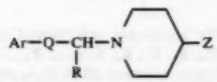
PCT Filed Jun. 1, 1979, Ser. No. 191,339

Claims priority, application Japan, Jun. 2, 1978, 53/66548

Int. Cl.[3] A61K *31/445;* C07D *401/04*

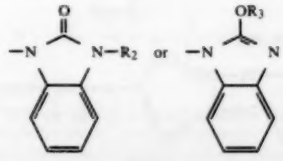
U.S. Cl. 424—267 13 Claims

1. A compound represented by the formula:



wherein Ar represents a naphthyl, phenyl or substituted phenyl group having 1 to 5 substituents wherein the substituent is a straight or branched-chain alkoxy group having 1 to 6 carbon atoms, a hydroxy group, a benzyloxy group or an alkylenedioxy group having 1 to 3 carbon atoms; Q represents

wherein R_1 represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms or an alkanoyl group having 2 to 6 carbon atoms; R represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms; and Z represents



wherein R_2 is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkanoyl group having 2 to 6 carbon atoms or an alkoxycarbonyl group having 2 to 6 carbon atoms and R_3 is an alkyl group having 1 to 5 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

11. A hypotensive composition which comprises an effective hypotensive amount of the compound defined in claim 1 and a pharmaceutically acceptable carrier.

4,446,142

SUBSTITUTED OXADIAZOLES AND THIADIAZOLES, AND METHODS OF PREPARATION AND USE THEREOF

Erich Cohnen, and Ben Armah, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

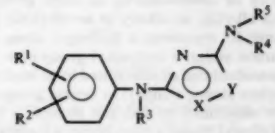
Filed Jun. 26, 1981, Ser. No. 277,535

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024187

Int. Cl.[3] A61K *31/41*

U.S. Cl. 424—269 23 Claims

1. A method of treating hypertension comprising administering to a warm-blooded animal an effective amount of a compound of the formula



(I)

wherein R^1 is hydrogen, halogen, or alkyl, R^2 is halogen or alkyl, R^3 is hydrogen, alkanoyl, or aliphatic, R^4 and R^5 are individually hydrogen or alkyl, wherein said alkyl and said alkanoyl are branched or straight chain and each contains 1 to 4 carbon atoms, X is oxygen, nitrogen or sulfur, Y is oxygen or nitrogen, and —X—Y— is —O—N—, —N—O—, or —S—N—, and pharmaceutically acceptable acid addition salts thereof, except

3-amino-5-(4-methyl-phenylamino)-1,2,4-oxadiazole,
3-(4-methyl-phenylamino)-5-amino-1,2,4-oxadiazole
3-(4-chloro-phenylamino)-5-amino-1,2,4-oxadiazole
3-(3,4-dichloro-phenylamino)-5-amino-1,2,4-oxadiazole
3-(2,3-dimethyl-phenylamino)-5-amino-1,2,4-oxadiazole
3-(2,3-dichloro-phenylamino)-5-amino-1,2,4-oxadiazole
3-(2-methyl-phenylamino)-5-amino-1,2,4-oxadiazole
3-(4-fluor-phenylamino)-5-amino-1,2,4-oxadiazole
3-(2,6-dichloro-phenylamino)-5-amino-1,2,4-oxadiazole
3-(2-chloro-phenylamino)-5-amino-1,2,4-oxadiazole
3-(4-chloro-phenylamino)-5-methylamino-1,2,4-oxadiazole
3-(2-chloro-phenylamino)-5-methylamino-1,2,4-oxadiazole
3-(3,4-dichloro-phenylamino)-5-methylamino-1,2,4-oxadiazole
3-(2,6-dichloro-phenylamino)-5-methylamino-1,2,4-oxadiazole.

4,446,143

RHODANINE DERIVATIVES

Tadao Tanouchi, Takatsuki; Satoshi Shigeoka, Neyagawa; Masanori Kawamura, Ibaraki; Masaki Hayashi; Hiroshi Terashima, both of Takatsuki, and Fumio Hirata, Suita, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

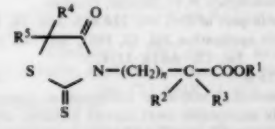
Filed Jul. 27, 1981, Ser. No. 286,839

Claims priority, application Japan, Jul. 28, 1980, 55-102410

Int. Cl.[1] C07D *277/36;* A61K *31/425*

U.S. Cl. 424—270 41 Claims

1. A rhodanine derivative represented by the general formula:



(I)

(wherein R^1 represents a hydrogen atom or an alkyl group of 1–12 carbon atoms; R^2 and R^3, which may be the same or

different with each other, each represents a hydrogen atom, an alkyl group of 1–4 carbon atoms, or a phenyl group; R^4 represents an alkyl group of 1–4 carbon atoms, a cycloalkyl group of 4–7 carbon atoms which is unsubstituted or substituted by at least one alkyl group of 1–4 carbon atoms, a phenyl or benzyl group which is unsubstituted or substituted by halogen atom(s), a trifluoromethyl group, a phenyl group, a nitro group, a hydroxy group, a carboxyl group, an amino group which may be substituted by an alkyl group of 1–4 carbon atoms, or alkyl(s), an alkoxy or an alkylthio group of 1–4 carbon atoms, a naphthyl group, an anthracenyl group, or a 5- or 6-membered heterocyclic ring or a 9- or 10-membered bicyclic fused heterocyclic ring, each containing one nitrogen, oxygen or sulfur atom which is unsubstituted or substituted by halogen atom(s), a trifluoromethyl group, a phenyl group, a nitro group, a hydroxy group, a carboxyl group, an amino group which may be substituted by an alkyl group of 1–4 carbon atoms, or alkyl(s), an alkoxy or an alkylthio group of 1–4 carbon atoms; R^5 represents a hydrogen atom, an alkyl gorup of 1–4 carbon atoms, a cycloalkyl group of 4–7 carbon atoms which is unsubstituted or substituted by at least one alkyl group of 1–4 carbon atoms, a phenyl or benzyl group which is unsubstituted or substituted by halogen atom(s), a trifluoromethyl group, a phenyl group, a nitro group, a hydroxy group, a carboxyl group, an amino group which may be substituted by an alkyl group of 1–4 carbon atoms, or alkyl(s), an alkoxy or an alkylthio group of 1–4 carbon atoms, a naphthyl group, an anthracenyl group, or a heterocyclic group containing one of nitrogen, oxygen and sulfur atoms which is unsubstituted or substituted by halogen atom(s), a trifluoromethyl group, a phenyl group, a nitro group, a hydroxy group, a carboxy group, an amino group which may be substituted by an alkyl group of 1–4 carbon atoms, or alkyl(s), an alkoxy or an alkylthio group of 1–4 carbon atoms; n represents 0, 1 or 2; with the proviso that when R^5 represents a hydrogen atom or an alkyl group of 1–4 carbon atoms, R^4 does not represent an alkyl group of 1–4 carbon atoms) or when R^1 represents a hydrogen atom, a non-toxic salt of the acid.

4,446,144
DERIVATIVES OF PENICILLANIC ACID

Welf von Daehne, Rungsted Kyst, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab), Ballerup, Denmark

Continuation-in-part of Ser. No. 145,880, May 1, 1980. This application Nov. 17, 1980, Ser. No. 207,614

Claims priority, application United Kingdom, May 21, 1979, 7917665; Sep. 5, 1979, 7930819; Nov. 29, 1979, 7941252; Feb. 27, 1980, 8006681

Int. Cl.[3] **C07D** *499/08;* **A61K** *31/425*

U.S. Cl. 424—270 **7 Claims**

1. A pharmaceutically-acceptable amine salt selected from the group consisting of the pivampicillin salt of 6β-bromopenicillanic acid, the pivampicillin salt of 6β-iodopenicillanic acid, and bacampicillin salt of 6β-bromopenicillanic acid and the bacampicillin salt of 6β-iodopenicillanic acid.

4,446,145
ANTI-MICROBIAL COMPOSITIONS FOR THE TOPICAL TREATMENT OF ACNE VULGARIS

Willem F. M. Van Bever, Turnhout, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 114,813, Jan. 24, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,975

Int. Cl.[3] **A61K** *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A pharmaceutical anti-acne composition comprising a pharmaceutically acceptable inert carrier material and as active ingredients from 4% to 6% of benzoylperoxide and from 1.5% to 2.5% of at least one chemical compound selected from the group consisting of clotrimazole, miconazole, econazole, isoconazole and a pharmaceutically acceptable acid addition salt thereof.

4,446,146
β-LACTAM CONTAINING COMPOUNDS, THEIR PREPARATION AND USE

Robert Southgate, Warnham; Terence C. Smale, Epsom Downs, and Roger J. Ponsford, Horsham, all of England, assignors to Beecham Group Limited, England

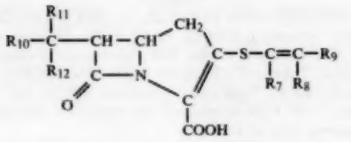
Filed Jul. 20, 1979, Ser. No. 59,463

Claims priority, application United Kingdom, Jul. 26, 1978, 31223/78; Jan. 6, 1979, 7900503

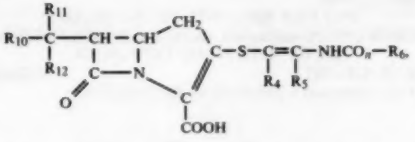
Int. Cl.[3] **A61K** *31/40;* **C07D** *487/04*

U.S. Cl. 424—274 **74 Claims**

1. A compound of the formula:

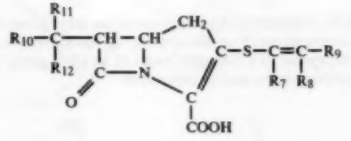


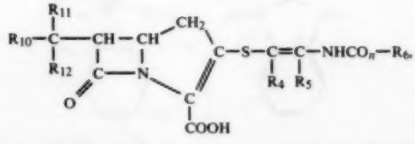
or



a pharmaceutically acceptable salt thereof or ester thereof, wherein each of R_4, R_5, R_7, R_8, R_{11} and R_{12}, independently of the others is hydrogen or lower alkyl; R_6 is ethyl, n-propyl or isopropyl, phenyl, fluorphenyl, chlorophenyl, bromophenyl or benzyl; R_9 is hydrogen, lower alkyl or phenyl; n is 1 or 2; and R_{10} is hydrogen, hydroxy, R_{13} *COO— or* $R_{13}OCOO$— in which R_{13} is lower alkyl, phenyl, benzyl, fluorobenzyl, chlorobenzyl, bromobenzyl, lower alkoxybenzyl or nitrobenzyl, and wherein the exocyclic double bond is in the Z configuration.

18. A pharmaceutical composition useful for treating bacterial infections in humans and domestic animals which comprises an antibacterially effective amount of a compound of the formula:





a pharmaceutically acceptable salt thereof or ester thereof, wherein each of R_4, R_5, R_7, R_8, R_{11} and R_{12}, independently of the others is hydrogen or lower alkyl; R_6 is ethyl, n-propyl or isopropyl, phenyl, fluorphenyl, chlorophenyl, bromophenyl or benzyl; R_9 is hydrogen, lower alkyl or phenyl; n is 1 or 2; and R_{10} is hydrogen, hydroxy, $R_{13}COO$— or $R_{13}OCOO$— in which R_{13} is lower alkyl, phenyl, benzyl, fluorobenzyl, chloro-

benzyl, bromobenzyl, lower alkoxybenzyl or nitrobenzyl, and wherein the exocyclic double bond is in the Z configuration, in combination with a pharmaceutically acceptable carrier.

4,446,147

AZAPROSTACYCLINS, THEIR PREPARATION AND PHARMACEUTICAL USE

Norbert Schwarz; Werner Skuballa; Helmut Vorbrueggen; Jorge Casals-Stenzel; Ekkehard Schillinger, and Michael H. Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

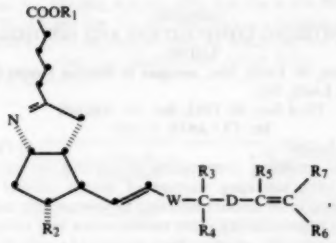
Filed Feb. 22, 1982, Ser. No. 350,674

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3107100

Int. Cl.[3] **C07D** *209/52;* **A61K** *31/40*

U.S. Cl. 424—274 **20 Claims**

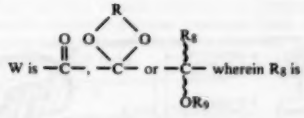
1. An azaprostacyclin of the formula



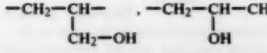
(I)

wherein

R_1 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{4-10} cycloalkyl, (e) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, (i) phenacyl, or (j) phenacyl substituted on the phenyl ring by bromine, phenyl, C_{1-4}-alkoxy, or di-C_{1-4}-alkoxy,



hydrogen or alkyl of 1–5 carbon atoms, R_9 is hydrogen, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid, the OR_9-group can be in the α- or β-position, and R is $-(CH_2)_{2-5}-$,



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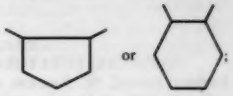
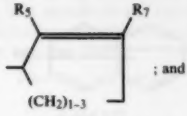


R_2 is OH or OR_9,

R_3 and R_4 each independently is hydrogen, alkyl of 1–5 carbon atoms, or fluorine,

D is $-(CH_2)_{1 \text{ or } 2}-$, $-(CH_2)_{1 \text{ or } 2}-$ substituted by C_{1-5}-alkyl or together with R_6 forms a ring of the formula



; and

(1) when D is optionally substituted alkylene as defined above, R_5 is H or C_{1-2}-alkyl and R_6 and R_7 each independently is H or C_{1-2}-alkyl or one is C_{1-2}alkyl and the other is halo; and

(2) when D forms a ring with R_6, $R_5$and R_7 each independently is H or C_{1-2}alkyl;

or for the compounds wherein R_1 is H, a physiologically compatible salt thereof.

4,446,148

BENZODIOXANYL IMIDAZOLINE COMPOUNDS, COMPOSITIONS AND USE

Michael R. Stillings, Hull, England, assignor to Reckitt & Colman Products Limited, Hull, England

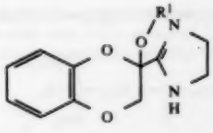
Filed Mar. 29, 1983, Ser. No. 480,370

Claims priority, application United Kingdom, Apr. 17, 1982, 8211205

Int. Cl.[3] **A61K** *31/415;* **C07D** *405/04*

U.S. Cl. 424—273 R **11 Claims**

1. A compound of the formula



(I)

wherein R^1 is alkyl C_{1-4}, allyl, benzyl, phenethyl or hydroxyalkyl C_{2-4} and its non-toxic salts, having the RS or S configuration.

6. A pharmaceutical composition for presynaptic α_2-adrenoreceptor antagonist use comprising a compound as claimed in claim 1, or a non-toxic salt thereof in an amount effective for said use together with a pharmaceutically acceptable diluent or carrier.

4,446,149

MEDICINE FOR TREATMENT OF CERVICAL EROSION

Kineshiro Nagai, No. 22-2, Yoyogi 4-Chome, Shibuya-Ku, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,650

Claims priority, application Japan, Dec. 14, 1981, 56-201345

Int. Cl.[3] **A61K** *31/415*

U.S. Cl. 424—273 R **5 Claims**

1. A method of treating cervical erosion in a human female suffering therefrom comprising the step of administering a preparation containing L-carnosine or physiologically accept-

able salts thereof in an effective amount for treating cervical erosion in said human female.

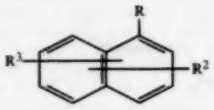
4,446,150

NAPHTHALENYLTHIAZOLE DERIVATIVES

Kazimir Sestanj, St. Laurent, and Francesco Bellini, Mount Royal, both of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

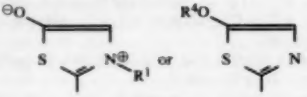
Filed Sep. 21, 1982, Ser. No. 420,776
Int. Cl.³ C07D *277/34*; A61K *31/425*
U.S. Cl. 424—270 **10 Claims**

1. A compound of formula I



(I)

wherein R is



wherein R^1 is lower alkyl; R^2 is a halo substituent on the naphthalene ring and R^3 is hydrogen, or R^2 and R^3 each is a substituent at positions 3, 4, 5 or 6 of the naphthalene ring selected from the group consisting of lower alkoxy, trihalomethyl and halo; and R^4 is lower alkyl.

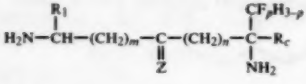
4,446,151

DECARBOXYLASE-INHIBITING FLUORINATED PENTANE DIAMINE DERIVATIVES

Fritz Gerhart, Kehl-Leutesheim, Fed. Rep. of Germany, and Viviane Van Dorsselaer, Strasbourg, France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Aug. 11, 1982, Ser. No. 407,238
Int. Cl.³ A61K *31/195*; C07C *87/26, 101/10*; A61K *31/13*
U.S. Cl. 424—319 **18 Claims**

1. A compound of the following general Formula I:



Formula I

wherein :

R_c represents hydrogen or carboxy;

R_1 represents hydrogen or C_1–C_6 alkyl;

Z represents methylene or oxygen;

m and n each represent 0 or 1 but m+n=1;

p represents 1 or 2,

or a pharmaceutically acceptable salt thereof.

18. A method of inhibiting ornithine decarboxylase in a patient in need thereof which comprises administering to said patient an effective ornithine decarboxylase inhibiting amount of a compound as defined in claim **1**.

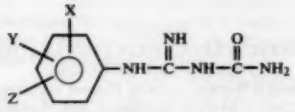
4,446,152

METHOD OF TREATING CONGESTIVE HEART FAILURE

Richard L. Riley, North Wales, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jun. 25, 1981, Ser. No. 277,148
Int. Cl.³ A61K *31/17*
U.S. Cl. 424—322 **6 Claims**

1. A method for the treatment of left ventricular heart failure in a patient wherein low cardiac output predominates, which comprises administering to said patient in need of treatment, in an amount effective to lower the peripheral resistance and to increase the cardiac output without any substantial change in blood pressure, of at least one compound of the formula:



where:

X is hydrogen or halo;

Y is hydrogen, halo, halololoweralkyl, nitro loweralkyl or loweralkoxy;

Z is halololoweralkyl, halololoweralkoxy, hydroxy, loweralkylsulfonyl, halo, loweralkoxy, loweralkyl, nitro or cyano;

and the non-toxic acid addition salts thereof in a suitable pharmaceutically acceptable carrier.

4,446,153

SKIN SANITIZING COMPOSITION AND METHOD OF USING

Kim W. Yang, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Sep. 30, 1982, Ser. No. 430,089
Int. Cl.³ A61K *31/045*
U.S. Cl. 424—343 **22 Claims**

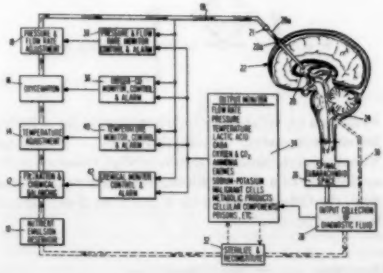
1. A teat sanitizing composition comprising an aqueous dispersion of a sanitizing mixture of benzyl alcohol and phenylethanol, in an amount effective to substantially reduce the bacteria population on a teat surface when said composition is applied thereto, an emulsifying amount of a surfactant to disperse said sanitizing mixture, said composition having a pH of between about 4 and 7.

4,446,154

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 275,117, Jun. 18, 1981, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, said Ser. No. 275,117, and Ser. No. 275,116, each is a division of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,685
Int. Cl.³ A61K *31/00*; A61M *5/14*
U.S. Cl. 424—350 **20 Claims**



1. An artificial central nervous system, cerebrospinal path-

way treatment liquid for treating hypoxic-ischemic cerebrospinal tissue, comprising, an aqueous emulsion containing:

(a) a non-aqueous fluorocarbon oxygen transfer component for selectively combining with oxygen and for transferring oxygen to said tissues to be treated;

(b) an aqueous nutrient component comprising at least essential electrolytes for said tissue; and

(c) an emulsification component for permitting the emulsification of said nutrient means with said oxygen transfer means; and at least one treatment agent selected from the group consisting of steroids and amino acids.

4,446,155

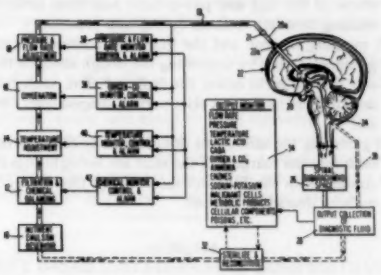
STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, said Ser. No. 275,117, and Ser. No. 275,116, each is a division of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,686

Int. Cl.[3] **A61K** *31/00;* **A61M** *5/14*

U.S. Cl. 424—350 **19 Claims**



1. A method of making an oxygenatable synthetic nutrient cerebrospinal treatment fluid for treating hypoxic-ischemic central nervous system tissue, comprising the steps of:

(a) emulsifying an oxygenatable fluorocarbon non-aqueous material with a synthetic electrolyte-containing cerebrospinal aqueous fluid to produce a physiologically acceptable emulsion;

(b) normalizing the electrolytes and adjusting the pH of said emulsion to produce an osmotically equilibrated and acid-base balanced emulsion;

(c) adding nutrients to said emulsion to produce said oxygenatable synthetic nutrient treatment fluid, said nutrients comprising at least one amino acid; and

(d) oxygenating said fluid.

4,446,156

MANUFACTURE OF TINPLATE AND TINPLATE CONTAINERS

Dietmar F. E. Salm, Bulli, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Continuation of Ser. No. 228,375, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 13,917, Feb. 22, 1979, abandoned. This application Apr. 12, 1982, Ser. No. 367,795

Claims priority, application Australia, Feb. 23, 1978, PD3490

Int. Cl.[3] **C25D** *5/48;* **B32B** *15/18*

U.S. Cl. 428—648 **12 Claims**

1. A method of producing an unreflowed solderable electrolytic tinplate by the Halogen process, comprising electrodepositing coatings of tin on opposite faces of strip steel from an electrolyte containing stannous tin and fluoride ions and rinsing the coated strip in a rinsing agent containing a concentration of fluoride ions not less than 8 g/l and, due to carry-over of electrolyte on the coated strip, stannous tin ions; wherein

the tin is electrodeposited on at least one of said faces to a coating mass of at least about 0.95 and less than 2.5 g/m^2 and the ratio of fluoride ions to stannous tin ions (F^-:Sn^{++}) in the rinsing agent is not less than 10:1.

4,446,157

PRENYL METHYL CARBONATE AND ORGANOLEPTIC USES THEREOF

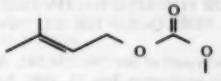
Richard M Boden, Ocean City; Manfred H. Vock, Locust, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 430,947, Sep. 30, 1982, Pat. No. 4,420,472. This application Sep. 1, 1983, Ser. No. 528,544

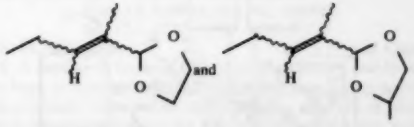
Int. Cl.[3] **A23L** *1/226, 1/235*

U.S. Cl. 426—3 **5 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to said consumable material from 0.5 parts per million up to about 100 parts per million based on the weight of said consumable material of prenyl methyl carbonate defined according to the structure:



5. A composition of matter comprising prenyl methyl carbonate and at least one cyclic acetal of 2-methyl-2-pentenal defined according to a structure selected from the group consisting of:



the weight ratio of prenyl methyl carbonate: cyclic acetal of 2-methyl-2-pentenal being from about 10:90 up to about 90:10.

4,446,158

APPARATUS FOR MAKING INDIVIDUAL BEVERAGE QUANTITIES

Philip H. English, 425-41 Hill Dr., Aurora, Ohio 44202, and Anthony D. Szpak, 6215 Jamestown Dr., Parma, Ohio 44134.

Filed Jun. 8, 1982, Ser. No. 386,284

Int. Cl.[3] **A47J** *31/02;* **B65B** *29/02*

U.S. Cl. 426—79 **13 Claims**

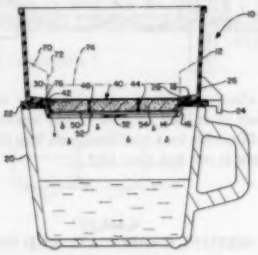
4. A disposable individual coffee container and filter comprising:

a uniform heighth annular frame having a spider web-like center section;

filter paper layers covering the top and bottom of said frame and center section being secured thereto;

said spider web-like center section including a plurality of webs defining a plurality of areas in said annular frame;

said filter paper layers and said areas combining to form a plurality of separate compartments: and



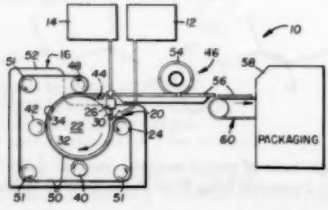
individual quantities of coffee received in said compartments, said webs being of the height of said annular frame and said compartments being filled with uniform heighth layer of ultra fine coffee particles, all areas of the coffee container and filter having substantially uniform water flow through characteristics.

4,446,159

METHOD FOR FORMING BACON-LIKE PRODUCTS

Eldon N. Roth, 14565 Quaker Hill Rd., Nevada City, Calif. 95959

Continuation-in-part of Ser. No. 168,542, Jul. 14, 1980, abandoned. This application Jun. 11, 1981, Ser. No. 272,511
The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.
Int. Cl.³ A23L *1/31;* A23P *1/00*
U.S. Cl. 426—249 **16 Claims**



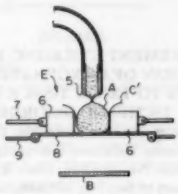
1. In a method for manufacturing a bacon-like product, the steps comprising forming first and second edible components to have a slurry or paste-like consistency, providing a refrigerated rotating drum to have a peripheral heat transfer surface, blending together and applying the first and second components onto the heat transfer surface of the drum as a sheet having an established initial thickness and generally continuous streaks of each component in a manner resembling natural bacon, the bacon-like sheet being placed in intimate contact with the heat transfer surface, cooling the bacon-like sheet upon the heat transfer surface of the drum and removing the bacon-like sheet from the drum.

4,446,160

PROCESS FOR MAKING A COMPOSITE EDIBLE PRODUCT

Tatsuo Shinriki, Chiba, Japan, assignor to Height, Inc., Matsudo, Japan

Division of Ser. No. 224,833, Jan. 13, 1981, Pat. No. 4,334,464. This application Mar. 11, 1982, Ser. No. 357,314
Claims priority, application Japan, Jan. 16, 1980, 55-3197
Int. Cl.³ A23P *1/00*
U.S. Cl. 426—297 **9 Claims**



1. A process of covering a ball of sticky edible paste material to form an edible product, comprising the steps of:

(1) depositing the ball onto a film of thin, flexible edible material and at least partially folding the film so as to partially encompass the ball sufficiently to help retain the shape of the ball and prevent the ball from undesirably sticking to other surfaces during said process;

(2) merging the ball and the film with a sheet of flattened glutinous dough by depositing the dough sheet on the ball and film so as to cover the ball and film, such that the dough sheet includes a skirt portion draped over the ball; and

(3) gathering the skirt of the dough sheet underneath the ball such that the margins of the skirt are brought together in contact with the film and the ball and film are enclosed without distorting the ball.

4,446,161

AROMATIC, MONOHYDRIC ALCOHOLS AS PRESERVATIVES FOR FOODS

Herman H. Friedman, Forest Hills; Frank Del Valle, Croton-on-Hudson, and Lisa A. Hofmann, Yonkers, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,720
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—335 **14 Claims**

1. In a food product containing fat, proteinaceous and farinaceous ingredients, a moisture content of from 12% to 80% by weight and a preservation system which is effective to prevent microbial or mite growth, the improvement consisting essentially of said preservation system containing a monohydric, aromatic alcohol in an amount effective to prevent the growth of mites, said monohydric aromatic alcohol being selected from the group consisting of benzyl alcohol, 2-phenyl ethanol, sec-phenyl ethanol, 3-phenyl-1-propanol, 1-phenyl-1-propanol, 2-phenyl-1-propanol, 2-phenyl-2-propanol, 1-phenyl-2-butanol, 2-phenyl-1-butanol, 3-phenyl-1-butanol, 4-phenyl-2-butanol, dl-1-phenyl-2-pentanol, 5-phenyl-1-pentanol, 4-phenyl-1-butanol, and combination of these and said preservation system being free of antimite agents other than said monohydric alcohol.

4,446,162

DECAFFEINATION OF A COFFEE EXTRACT

Peter D. Malizia, Fish Kill, and Jerome F. Trumbetas, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,111

Int. Cl.³ A23F *5/22*

U.S. Cl. 426—424 **6 Claims**

1. A process for decaffeinating an aqueous coffee extract which comprises contacting said extract containing about 25% by weight coffee solids with a fatty solvent while concurrently vacuum distilling a portion of the water initially present from the aqueous coffee entract until the extract contains about 90% by weight coffee solids and subsequently separating decaffeinated coffee extract and caffeine-containing fatty solvent.

4,446,163

PROCESS OF MANUFACTURING A STARCH-BASED FOOD PRODUCT

Edward L. Galle, St. Paul; Roy G. Hyldon, Bloomington, and William P. Egar, Wayzata, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 294,876, Aug. 21, 1981. This application Jun. 29, 1982, Ser. No. 392,301

Int. Cl.³ A23L *1/10, 1/182*

U.S. Cl. 426—448 **44 Claims**

1. A process of manufacturing a starch-based food item comprising the steps of:

providing a mixture of ground material, with said material comprising at least about 20% starch by weight of mixture on a dry basis;

hydrating said mixture to form a blend, said mixture being hydrated sufficiently to provide pressure formability to said blend;

pressure forming said blend to form individual pieces; and

heating the pressure formed pieces by exposing said pieces to substantially saturated steam at a super atmospheric pressure above about 0.5 psig in an autoclave for a time sufficient to gelatinize a major portion of said starch.

4,446,164

WHEY BASED IMITATION MILK COMPOSITIONS

Roy A. Brog, 1600 N. Main, Logan, Utah 84321

Continuation-in-part of Ser. No. 361,761, Mar. 25, 1982, Pat. No. 4,397,927, which is a continuation-in-part of Ser. No. 185,534, Sep. 9, 1980, Pat. No. 4,337,278. This application May 4, 1983, Ser. No. 491,555

Int. Cl.³ A23C *11/04*

U.S. Cl. 426—583 **20 Claims**

1. An imitation milk composition having a solids content consisting essentially of 10 to 65 percent by weight sweet whey solids, 2 to 20 percent by weight of a water soluble protein, 5 to 40 percent by weight of an added sugar, 5 to 35 percent by weight of an edible vegetable oil, and 3 to 42 percent by weight of other milk solids not fat, wherein the weight ratio of water soluble protein to the protein in the whey may vary from about 0.2:1 to 1.5:1, and wherein the weight ratio of added sugar to the lactose in the whey and added milk solids not fat may vary from about 0.2:1 to 1.5:1.

4,446,165

OLEAGINOUS COMPOSITIONS

Bruce A. Roberts, Goshen, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 46,886, Jun. 8, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 313,063

Int. Cl.³ A23D *5/00, 3/00*

U.S. Cl. 426—602 **27 Claims**

1. A composition of matter in the form of a water-in-oil emulsion, which comprises:

(a) from about 25% to about 95% by weight of said composition of a first oil phase selected from the group consisting of:

(i) solid fats and solidified oils; and

(ii) liquid oils containing at least about 0.5% by weight of said liquid oil of a water-in-oil emulsion stabilizing agent;

said first oil phase having substantially homogeneously distributed therethrough;

(b) from about 5% to about 75% by weight of said composition of an aqueous disperse phase;

(c) said composition having dispersed therethrough an effective amount of particles comprising a water-in-oil emulsion destabilizing surfactant in a passive state having an hydrophilic-lipophilic balance greater than about 6, said particles being in the form of encapsulated droplets of a second oil phase having said destabilizing surfactant as a component thereof;

(d) said destabilizing surfactant being capable of inverting said composition to an oil-in-water emulsion when released from said particles.

4,446,166

CHOCOLATE COMPOSITION FOR THE PREPARATION OF HEAT-RESISTANT CHOCOLATE ARTICLES AND PROCESS FOR ITS PREPARATION

Claude Giddey, Geneva, and Georges Dove, Carouge, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation of Ser. No. 229,729, Jan. 29, 1981, abandoned. This application Mar. 17, 1983, Ser. No. 476,396

Claims priority, application Switzerland, Jan. 30, 1980, 731/80

Int. Cl.³ A23G *1/00*

U.S. Cl. 426—631 **17 Claims**

1. A chocolate composition for use in the preparation of a heat-resistant chocolate article comprising a chocolate mass containing cocoa butter, sugar, milk solids and cocoa solids, and dispersed throughout the mass, from 2 to 10% by weight of the composition of a water-in-fat emulsion, at least 20% of the fat being in solid form.

4,446,167

FOOD CASING WHICH WILL TRANSFER A SMOKE COLOR AND FLAVOR TO FOOD ENCASED THEREIN AND BASIC NATURAL LIQUID SMOKE FOR USE THEREWITH

Burl L. Smith, Danville, Ill., and Ronald S. Kearby, State Line, Ind., assignors to Teepak, Inc., Chicago, Ill.

Filed Jul. 8, 1982, Ser. No. 396,512

Int. Cl.³ A22C *13/00*; A23L *1/221*

U.S. Cl. 426—650 **18 Claims**

1. A method of forming a liquid smoke colorant and flavorant from an aqueous natural liquid smoke comprising providing a natural liquid smoke and alkalizing, to a pH of above about 10, said natural smoke with an alkaline material to the degree that precipitate materials are in solution.

4,446,168

METHOD OF FORMING AMORPHOUS SILICON

Kazuhisa Kato, Atsugi, and Hiroyuki Yagami, Machida, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 363,236

Claims priority, application Japan, Apr. 3, 1981, 56-49299

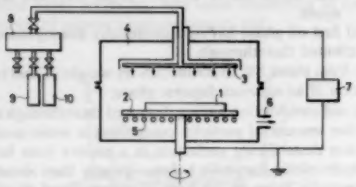
Int. Cl.³ H01L *45/00*

U.S. Cl. 427—39 **13 Claims**

1. For use in the production on a substrate of a semiconductor device through plasma chemical vapor deposition technique, a method of forming an amorphous silicon film, one side of this film being intended for ohmic contact with a metal electrode to provide an ohmic contact, comprising the steps of:

placing said substrate in an evacuated container;

introducing a starting gas containing at least a silicon-containing gas into said evacuated container; and



subjecting said gas in said chamber to a glow discharge at a power density of substantially 0.3W/cm^2 or greater, thereby causing an amorphous silicon film to deposit onto said substrate.

4,446,169

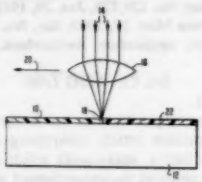
METHOD FOR MAKING SILICON CARBIDE COATINGS

Peter M. Castle; George G. Sweeney, both of Penn Hills, and Lymperios N. Yannopoulos, Churchill Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 16, 1982, Ser. No. 418,941

Int. Cl.^{3} B05D *3/06*

U.S. Cl. 427—53.1 **18 Claims**



1. A method of preparing a silicon carbide-coated article comprising the steps of:

placing a coating of a silicon carbide precursor polymer on a substrate; and

directing onto said coating a laser beam with energy sufficient to raise the temperature of said coating in the area of impingement of the laser beam to approximately 1200° C., to 1600° C., until said coating is converted into a silicon carbide ceramic material, wherein said coating in the area of impingement is located in an inert atmosphere or vacuum.

4,446,170

METHOD OF MANUFACTURING A MAGNETIC RECORDING FILM OF A THIN METALLIC FILM TYPE

Seizou Watanabe, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,943

Claims priority, application Japan, Aug. 2, 1982, 57-134884

Int. Cl.^{3} H01F *10/02*

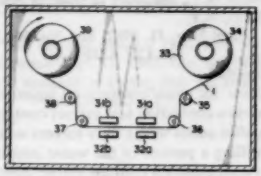
U.S. Cl. 427—130 **9 Claims**

1. A method of manufacturing a magnetic recording film of a thin metallic film type, comprising:

a step of forming a magnetic layer in the form of a thin metallic film on a base film, while providing a predetermined level of tension in said base film;

a thermal treatment step of heating said film with said magnetic layer to a first temperature level, at which thermal shrinkage of the base film is caused, while providing said predetermined tension in said film; and, then, cooling said film, thereby removing any curls and wrinkles found therein; and

an additional thermal treatment step of heating said thermally treated film to a second temperature level, which is lower than said first temperature level, and cooling said



film, thereby removing thermal stress in said magnetic layer.

4,446,171

PROCESS OF MAKING GLASS ARTICLES HAVING ANTIREFLECTIVE COATING

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 12, 1982, Ser. No. 348,622

Int. Cl.^{3} B05D *1/18, 5/06;* C03C *17/25;* G02B *1/10*

U.S. Cl. 427—160 **4 Claims**

1. A process of making a glass article containing a thin surface film antireflective coating comprising the steps of

(1) providing a noncolloidal dispersion containing at least one metallo-organic compound in solution and at least one organic polymer in solution,

(2) depositing a thin coating of such dispersion on the glass substrate,

(3) heating the film to drive off the solvent and to decompose and drive off the organic components and to eliminate or drive off the organic polymer,

thus forming an inorganic oxide film from the remaining inorganic oxide components of such compound, said heating stopping short of causing consolidation of the oxide film, thus leaving a skeletonized, porous surface film having an effective refractive index less than that of a nonporous film of said inorganic oxide.

4,446,172

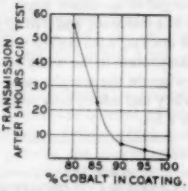
METHOD OF FORMING A HIGH PERFORMANCE REFLECTIVE FILM ON A GLASS SHEET

Narayandas Malani, Grosse Ile, and Thomas E. Boller, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 4, 1983, Ser. No. 491,146

Int. Cl.^{3} C03C *17/245*

U.S. Cl. 427—160 **6 Claims**



1. A method of forming a high performance reflective film on a glass sheet, said glass sheet being at a temperature sufficiently high to pyrolyze an organic based, metal containing glass coating composition coming into contact therewith, said method being characterized by the step of:

directing against a surface of said heated glass sheet an organic based, heat pyrolyzable, dual metal containing glass coating composition in which said dual metals are

cobalt and iron, and in which said weight percentage of said dual metals are in a range from 97% cobalt/3% iron to 90% cobalt/10% iron.

4,446,173

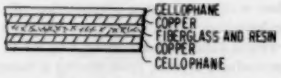
COPPER-CLAD POLYESTER-GLASS FIBER LAMINATES USING ZINC-COATED COPPER

David Barrell, Temple City; Donald E. Kennedy, Baldwin Park; James J. Marino, Jr., Monrovia, and Donald C. Rollen, Railto, all of Calif., assignors to Glasteel Tennessee, Inc., Duarte, Calif.

Continuation-in-part of Ser. No. 291,929, Aug. 11, 1981. This application Feb. 17, 1982, Ser. No. 349,676

Int. Cl.[3] B32B *15/00;* B05D *1/14*

U.S. Cl. 427—206 23 Claims



1. A continuous process for preparing a metal foil laminate having at least one sheet of an electrogalvanized zinc-coated metal foil directly bonded to a face of a sheet of a glass fiber reinforced linear polyester resin, comprising:

applying a coating of a polyester resin to a first electrogalvanized zinc-coated metal foil, selected from the group consisting of copper foil, aluminum foil, silver foil, gold foil, tantalum foil, and titanium foil,

uniformly distributing a glass mat on said linear polyester resin coating,

heating said glass fiber containing linear polyester resin coated metal foil to partially gel said resin,

applying pressure to said partially gelled linear polyester resin coated metal foil, and

curing said linear polyester resin.

4,446,174

METHOD OF INK-JET RECORDING

Masakazu Maekawa; Sukenori Nakamura, both of Shizuoka; Masatoshi Sugiyama, and Hideo Odawara, both of Tokyo, all of Japan, assignors to Fuiji Photo Film Company, Ltd., Kanagawa, Japan

Filed Apr. 28, 1980, Ser. No. 144,115

Claims priority, application Japan, Apr. 27, 1979, 54-52114; May 14, 1979, 54-58788

Int. Cl.[3] B41M *3/00*

U.S. Cl. 427—261 8 Claims

1. An ink-jet recording method for producing a recorded image on an image-receiving sheet with a jet of aqueous ink, wherein an ink-jet is projected onto an image-receiving sheet with a surface layer containing a pigment and an adhesive, and having an Rf value, which is the flow rate measured for a combination of said surface layer and a dye in said aqueous ink, of less than 0.59.

4,446,175

COATINGS FORMED FROM ISOCYANATE-FUNCTIONAL POLYMERS CONTAINING A TERMINAL MONOSULFIDE GROUP

Darryl W. Brixius, Grosse Ile, Mich., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 195,081, Oct. 8, 1980, Pat. No. 4,351,755, which is a continuation-in-part of Ser. No. 53,301, Jun. 29, 1979, abandoned, which is a division of Ser. No. 819,121, Jul. 26, 1977, abandoned. This application Dec. 7, 1981, Ser. No. 328,113

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—385.5 23 Claims

1. The process of coating a substrate which comprises

(A) applying to a substrate an isocyanate-functional polymer of the number average molecular weight of 500–10,000 formed from at least 10% by weight of isocyanatoalkyl acrylate or isocyanatoalkyl methacrylate, polymerized alone or with a polymerizable comonomer,

any polymerizable comonomer being at least one member of the group consisting of alkyl acrylates and methacrylates; styrene, ethylene; vinyl acetate; and vinyl chloride,

in the presence of 1–20% by weight, based on the weight of the polymer, of a mercaptan chain-transfer agent, at least 10% by number of the polymer molecules having in terminal position a residue of the mercaptan chain-transfer agent, and

(B) curing the applied polymer upon the substrate.

4,446,176

FLUOROELASTOMER FILM COMPOSITIONS CONTAINING PHENOXY RESINS AND METHOD FOR THE PREPARATION THEREOF

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Continuation of Ser. No. 178,789, Aug. 18, 1980, Pat. No. 4,343,841. This application Jul. 23, 1982, Ser. No. 401,095

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

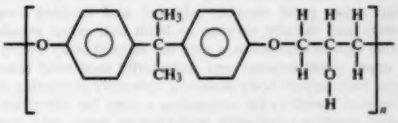
Int. Cl.[3] B05D *3/02;* C08L *63/00*

U.S. Cl. 427—386 14 Claims

1. A method for preparing fluoroelastomer film compositions comprising the steps of:

dissolving a fluoroelastomer gum in a solvent; and

adding a phenoxy resin to said gum solution, having the general formula



where n is about 100; and

evaporating said solvent and baking the resulting film.

4,446,177

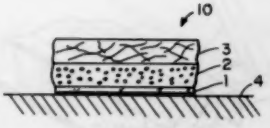
REINFORCED PLASTIC PRODUCT

George L. Munoz, 11352 James Grant, El Paso, Tex. 79936, and William J. Munoz, Lo 200 Sumatra, El Paso, Tex. 79925

Filed Mar. 12, 1982, Ser. No. 357,685

Int. Cl.[3] B44F *9/04*

U.S. Cl. 428—15 19 Claims



1. A simulated stone composite formed of a reinforced plastic product comprising:

(a) a gelcoat layer comprised of a thermoplastic or thermoset resin;

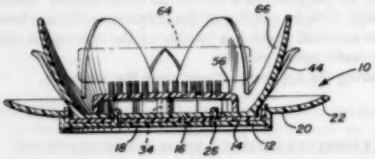
(b) a resin matrix layer having dispersed therein fillers and colorants laid up on the inner side of said gelcoat layer; and

(c) a backup layer comprised of a polyester fiber sheet which has been impregnated with thermoplastic or thermoset resin laid up on said matrix layer.

4,446,178
DECORATIVE BAR SOAP HOLDER

Yvonne B. Daugherty, 567 Sea Pine La., Deer Creek, Deerfield Beach, Fla. 33441

Filed Sep. 22, 1982, Ser. No. 421,584
Int. Cl.³ A41G 1/00
U.S. Cl. 428—26 6 Claims

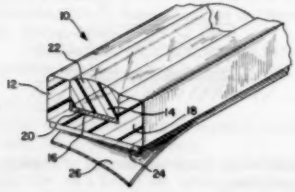


1. A decorative bar soap holder including an upwardly opening base assembly in which a bar of soap may be placed intermediate periods of bar soap usage, said base assembly including a first lower panel member including a plurality of upstanding locator pins and a plurality of upwardly projecting latching tongues whose upper end portions may be laterally flexed and include upper end downwardly facing laterally extending abutment shoulder portions spaced below the upper terminal ends thereof, a second panel member overlies said first panel member and including first and second sets of openings formed therethrough upwardly through which said pins and tongues project, at least one additional panel member overlying said second panel member and having latching tongue and locator pin openings formed therethrough upwardly through which the upper ends of said tongues and pins project, said shoulder portions overlying upwardly facing surface portions of said upper panel member adjacent said latching tongue openings and thereby serving to latch said panel members together against separation, a soap bar support body overlying said upper panel member and stationarily supported relative thereto, said support body including upwardly projecting soap bar support members for supporting a soap bar therefrom in elevated position relative to said support body, said lower, second and upper panel members including peripherally spaced decorative portions spaced thereabout.

4,446,179
TRIM STRIP FOR AUTOMOBILE BODIES

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Continuation-in-part of Ser. No. 380,783, May 21, 1982, abandoned. This application Feb. 28, 1983, Ser. No. 468,721
Int. Cl.³ B60R 13/04
U.S. Cl. 428—31 12 Claims



1. A trim strip comprising:
an elongate moulding, said moulding having a lower surface for receiving adhesive or otherwise attaching said trim strip to the body of a vehicle,
an elongate channel formed in the upper surface of said moulding having a floor and two side walls or shoulders,
an elongate decorative surface in said channel, and
a weather-resistant and impact-resistant clear plastic cap cast over said decorative surface and having radiused edges providing a lens effect to said decorative surface beneath and thereby optically enhancing the appearance of said decorative surface as viewed through said clear plastic cap.

4,446,180
ADHESIVE COMPOSITION, FILM LAMINATE AND PRODUCT POUCH OR TUBE THEREFROM

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corp., New York, N.Y.

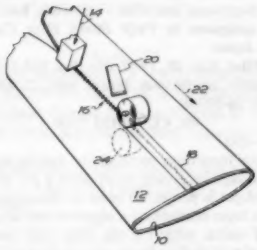
Division of Ser. No. 386,458, Jun. 8, 1982. This application Aug. 4, 1983, Ser. No. 520,405
Int. Cl.³ B32B 27/08; C08L 53/00
U.S. Cl. 428—35 8 Claims

1. A film laminate comprising two or more polymeric films bonded together with an adhesive combination of:
(a) a styrene-butadiene block copolymer having a monomer parts by weight ratio of from about 1 to 3:3 to 1;
(b) a cyclopentadiene-styrene resin having a monomer parts by weight ratio of from about 1:2 to 1:4 respectively; and
(c) a random terpolymer of (1) 1,3-pentadiene, (2) a monocyclic terpene; and (3) alpha methylstyrene, wherein the monomers are in a parts by weight ratio of from about 3–4:3–4:2.5–3.5 respectively; said combination comprising a parts by weight ratio of from about 7–10 of (a), 0.5–1.5 of (b), and 2–4 of (c).

4,446,181
MANUFACTURE OF TUBULAR LAMINATES

Eric Wood, Wakefield, England, assignor to Insituform International Inc., Monrovia, Liberia

Continuation of Ser. No. 77,538, Sep. 21, 1979. This application Mar. 30, 1982, Ser. No. 363,625
Claims priority, application United Kingdom, Sep. 28, 1978, 37737/78
Int. Cl.³ B32B 7/08; F16L 7/00
U.S. Cl. 428—36 5 Claims



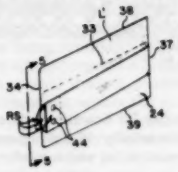
1. A method for the continuous production of tubular liner in long lengths which is for lining a passageway or pipeline when impregnated with curable synthetic resin, wherein the tubular liner is formed from a supply of a flat web laminate comprising a resin absorbent layer, on one side of which is bonded an impermeable layer, the method comprising the steps of feeding web continuously in the direction of its length and while the web is in said continuous motion effecting the step of (i) forming it to tubular configuration so that the impermeable layer lies to the outside, and so that the free edge faces come into butting relationship (ii) sewing the said edges together while they remain in edge face to edge face butting relationship by means of stitching which extends across the seam, and (iii) applying a sealing ribbon or coating on the outside of the moving tubular liner and over the stitching to prevent leakage of resin through the stitching holes when the liner is being installed.

5. A tubular laminate produced by the method according to any one of claims 1, 2, or 3.

4,446,182
RECORD ASSEMBLY

Donald E. Cavender, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 721,005, Sep. 7, 1976, Pat. No. 4,070,220, which is a division of Ser. No. 520,710, Nov. 4, 1974, Pat. No. 3,993,814. This application Jan. 6, 1978, Ser. No. 867,396
Int. Cl.³ G09F 3/10
U.S. Cl. 428—40 8 Claims



1. In a label-price tag composite, a shipping label having an adhesive on the back side thereof, a backing sheet adhered to the back side of the label,

and a price tag sheet secured at one edge thereof to one edge of the label with a fold line formed therebetween and having an adhesive on the back side thereof,

the price tag sheet being folded along said edges back under the label and the backing sheet and adhered to the backing sheet and peelable therefrom,

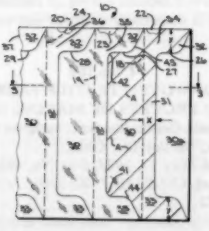
the price tag sheet and the backing sheet covering only a portion of the back side of the label and leaving uncovered at least a portion of the back side of the label, whereby the uncovered portion of the back side of the label can be adhered to an article to be shipped,

the backing sheet extending no farther under the price tag sheet than the fold line so that the price tag sheet is easily folded under the label.

4,446,183
TAG WITH ATTACHED FOLD-OVER TRANSPARENT COVER ELEMENT

Michael D. Savagian, Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Aug. 30, 1982, Ser. No. 412,625
Int. Cl.³ B32B 3/18
U.S. Cl. 428—42 8 Claims



1. As assembly having a plurality of tag-cover element units in which the cover element associated with a tag includes a portion adapted to be adhered to a surface of the tag after the application of identification data thereto, the assembly including

(1) a web of tag material having an upper surface and a lower surface,

(2) a web of transparent cover element material carrying a layer of transparent pressure sensitive adhesive on one of its surfaces,

(3) the layer of transparent pressure sensitive adhesive on the web of cover element material being releasably joined to the lower surface of the web of tag material to form the assembly,

the improvement wherein:

(4) a series of spaced slits extend through the web of tag material to define a plurality of individual adjacent tags;

(5) a series of spaced slits extend through the web of cover element material and layer of pressure sensitive adhesive carried thereon to define a plurality of individual adjacent cover elements, there being one cover element associated with each tag,

the cover element associated with each tag having a connecting portion adhered to the lower surface of the tag and a flap adhered to the lower surface of an adjacent tag;

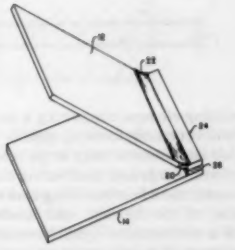
(6) each tag and its associated cover element being detachable from the assembly along the aforesaid slits to provide a tag-cover element unit including a flap extending beyond an edge of the tag and an exposed portion of the layer of pressure sensitive adhesive on the flap,

the flap being foldable over said edge of the tag and adherable to the upper surface of the tag for protection of identification data applied thereto.

4,446,184
FLEXIBLE NON-EXTENSIBLE HINGE FOR PHOTOMASK ASSEMBLY

George H. Bowser, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 5, 1982, Ser. No. 355,040
Int. Cl.³ B32B 17/06; G03B 27/04
U.S. Cl. 428—57 19 Claims



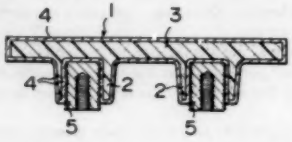
1. In a method for making a hinged photomask assembly by joining two rigid plates, at least one of which comprises a photomask image, by means of a flexible polymeric hinge, the improvement which comprises positioning a flexible, non-extensible strip over said polymeric hinge and attaching said strip to adjacent coplanar surfaces of the two plates, thereby permitting flexing of the hinge while preventing lateral movement of the plates.

4,446,185

REACTION INJECTION MOLDED ARTICLE WITH THREADS AND METHOD OF MOLDING SAME

Kenichi Waragai, Fujisawa; Masao Gotoh, Yokosuka; Hitoshi Yokono, and Kazumi Iijima, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,456
Claims priority, application Japan, Mar. 13, 1981, 56-35429; Apr. 28, 1981, 56-63348
Int. Cl.³ B32B 3/24
U.S. Cl. 428—67 15 Claims



1. A reaction injection molded article of a foamed polyurethane resin material, formed by mixing and foaming an A liquid and B liquid, the A liquid comprising a polyol, a catalyst and a foaming agent, the B liquid comprising polyisocyanate, comprising:

a molded article of said foamed polyurethane resin material, having a surface layer of density of 0.5–1.1 g/cm^3, said surface layer being a skin layer of the polyurethane resin material, with substantially no foaming action having taken place in said skin layer, said molded article body having holes enclosed by said surface layer; and

female threaded members each inserted in one of said holes, said members being held in place rigidly by said surface layer.

4,446,186

BUILDING ELEMENT

Lauritz B. L. Rasmussen, Lyngby, Denmark, assignor to Superfos Glasuld A/S (Superfos A/S), Vedbaek, Denmark

Division of Ser. No. 212,512, Dec. 3, 1980, Pat. No. 4,372,799. This application Dec. 29, 1982, Ser. No. 454,162
Claims priority, application Denmark, Dec. 12, 1979, 5283/79
Int. Cl.³ B32B 31/04; C09J 5/02
U.S. Cl. 428—74 5 Claims

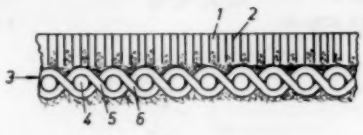
1. A building element comprising a pair of opposed air impermeable cover boards forming opposite major surfaces of the element, air impermeable edge strips separating and connecting said cover boards and constituting the side and end edges of the element, and a heat insulating core member positioned in the interior of the element, said insulating member being formed as a substantially rigid, formstable core plate of an insulating material having an air permeable internal structure and a size and shape so as to occupy substantially all of the space within the element, both major surfaces of said core plate being inseparably bonded to said cover boards by means of a moisture curing adhesive applied to said major surfaces and the internal surfaces of the cover board and by means of a partial vacuum established in the core plate to effect pressing of the cover boards onto said core plate during curing of the adhesive, said vacuum being achieved by means of applied suction through an opening located in the closed casing.

4,446,187

SHEET ASSEMBLY AND METHOD OF MANUFACTURING SAME

Nils O. Eklund, Halmstad, Sweden, assignor to Nordiskafilt AB, Halmstad, Sweden

Filed Mar. 26, 1981, Ser. No. 247,775
Claims priority, application Sweden, Apr. 1, 1980, 8002483
Int. Cl.³ B32B 3/10
U.S. Cl. 428—136 9 Claims



1. A sheet assembly for dewatering fiber webs comprising:

a layer of substantially liquid-impermeable material in contact with said webs; and a reinforcing structure;

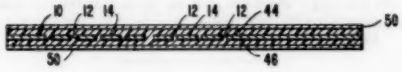
said sheet having substantially vertical through-channels formed at least through said layer, said through-channels being adapted to lead water away from said fiber webs when the layer is placed in contact with said fiber webs.

4,446,188

MULTI-LAYERED CIRCUIT BOARD

Harshad K. Patel, Los Angeles, and Andjelko Illick, Downey, both of Calif., assignors to The Mica Corporation, Culver City, Calif.

Filed Dec. 20, 1979, Ser. No. 105,723
Int. Cl.³ B32B 3/10, 15/04
U.S. Cl. 428—138 5 Claims



1. A layered clad laminate with universal center plane adapted for the manufacture of printed wiring board comprising an electrically conductive self-sustaining, integral metal center sheet having, in repetitive fashion a series of predetermined patterns of drilled, punched or photochemically developed openings therein, said sheet being pressed between electrical insulating layers of resin impregnated reinforcing material, said layers being adhered to said sheet and to each other through said openings, and on each of the outer surfaces of said laminate and adhered thereto a layer of electrically conductive metal foil which is essentially uniform and imperforate.

4,446,189

TEXTURED NONWOVEN TEXTILE FABRIC LAMINATE AND PROCESS OF MAKING SAID

Gerald A. Romanek, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 12, 1983, Ser. No. 493,832
Int. Cl.³ B32B 3/00, 5/06, 5/26
U.S. Cl. 428—152 28 Claims

1. A method of producing a laminated article of manufacture comprising:

(a) positioning in superposed relation a nonwoven textile fabric layer comprising a plurality of fibers and a layer of generally elastic material having inherent resilience to form superposed layers;

(b) needle punching said superposed layers to secure said fabric layer to said layer of generally elastic material at a plurality of needle punched locations each spaced a predetermined distance from the next adjacent needle punched

location to secure said fabric layer to said layer of generally elastic material at said needle punched locations and thereby form needle punched superposed layers;

(c) drafting said superposed layers in at least one direction an amount within the elastic limit of said layer of generally elastic material to thereby permanently stretch said nonwoven textile fabric layer; and

(d) thereafter allowing said thus needle punched and drafted superposed layers to relax, thereby permitting said layer of generally elastic material to substantially return to its original dimensions in response to its inherent resilience whereby the bulk of said stretched nonwoven textile fabric layer is increased between said needle punched locations.

22. A laminated article of manufacture comprising:

an inner layer of generally elastic material of inherent resilience having opposite sides, said generally elastic material being capable of being drafted in response to a drafting force from a first relaxed condition defined be a first set of dimensions to a second drafted condition defined be a second set of dimensions within the elastic limit of said generally elastic material, and further being capable of retracting from said second condition to substantially said first position in response to its inherent resilience upon release of said drafting force;

a first outer layer comprising a first generally inelastic nonwoven textile fabric comprising a plurality of generally coherent nonwoven fibers and superposed on one of the opposite sides of said inner layer of generally elastic material, said first outer layer being capable of being drafted in response to a drafting force from a first relaxed condition defined by a first set of dimensions to a second drafting condition defined by a second set of dimensions beyond the elastic limit of said first generally inelastic nonwoven texiile fabric, and further being incapable of self-induced retraction from said second condition to said first condition upon release of said drafting force; and

said layers being secured together at a plurality of locations spaced a distance one from the other by means of a plurality of said nonwoven fibers extending from said first outer layer through said inner layer of generally elastic material at at least one penetration point at each of said locations when said inner and outer layers are in their second conditions, whereby said first outer layer exhibits increased bulk intermediate said plurality of locations when said inner layer retracts from its second condition to substantially its first position.

4,446,190

CERAMIC TILE WITH ITS REAR CONFIGURED AS UNIFORMLY DISTRIBUTED PROJECTIONS

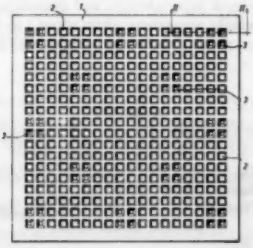
Ermanno Pernici, Reggio Emilia, Italy, assignor to C.I.E.F. -Compagnia Immobiliare e Finanziaria S.p.A., Modena, Italy

Filed Mar. 1, 1983, Ser. No. 470,959

Claims priority, application Italy, Apr. 2, 1982, 46819 A/82

Int. Cl.³ B32B *3/30, 3/26*

U.S. Cl. 428—156 **6 Claims**



1. A ceramic tile having a front surface and a rear surface, said rear surface being uniformly covered with tapered frusto-conical or square based frusto-pyramidal shaped projections (2) of constant height, interspersed with groups of at least two projections (3) of greater height which have the same size base as the projections (2) of constant height and are distributed over the entire rear surface of the tile (1) to constitute resting feet.

4,446,191

LAMINATES COMPRISING PREPREGS METAL CLAD

Yasuo Miyadera; Atsushi Fujioka, both of Shimodate; Tetsuo Kumazawa, and Doi Hiroaki, both of Ibaraki, all of Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,393

Claims priority, application Japan, Oct. 27, 1980, 55-149459; Oct. 27, 1980, 149460; Oct. 27, 1980, 55-149463

Int. Cl.³ B32B *5/08*

U.S. Cl. 428—245 **16 Claims**

1. A metal-clad laminate produced by impregnating composite fabric comprising 30–95% by weight of aromatic polyamide fiber and 5–70% by weight of glass fiber arranged together, with a resin to form a prepreg, laminating a plurality of said prepregs together with at least one metallic foil, and molding the laminated metal-clad prepregs under heat and pressure.

4,446,192

WEAR-RESISTANT RUBBER PRODUCT AND A METHOD OF MAKING SAME

Bengt L. A. Dehlén, Trelleborg, Sweden, assignor to Trelleborg AB, Trelleborg, Sweden

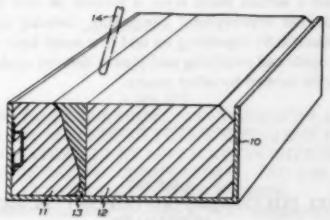
PCT No. PCT/SE80/00266, 371 Date Jul. 16, 1981, 102(e) Date Apr. 27, 1981, PCT Pub. No. WO81/01253, PCT Pub. Date May 14, 1981

PCT Filed Oct. 30, 1980, Ser. No. 261,226

Claims priority, application Sweden, Jun. 11, 1979, 7909159

Int. Cl.³ B02C *17/22;* B32B *25/08*

U.S. Cl. 428—339 **6 Claims**



1. A wear-resistant rubber product adapted to be used as a lifter in grinding mills, said product comprising at least two prefabricated parts, one of said parts including a holder for mounting said product, the other said part being a prefabricated vulcanized wear-resistant rubber body having a profile corresponding to the intended profile of a portion of the rubber product, said parts being interconnected with one another by means of a binder, characterized in that the binder consists essentially of a layer of urethane rubber cast and vulcanized in situ between said prefabricated parts, said layer having a thickness of at least 2 mm.

4. A product as claimed in claim 1 wherein said holder for mounting the product includes means for attaching the product to a rotating drum of a grinding mill, and the other said part includes a lifter portion which has a profile operable as a lifter in a grinding mill.

4,446,193

PROCESS FOR CHEMICALLY BONDING LUBRICANT TO AN INFORMATION CARRIER AND PRODUCTS THEREOF

Ali Afzali-Ardakani, Ossining, N.Y.; John I. Crowley, Palo Alto, and Anthony W. Wu, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,918
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—422 **6 Claims**

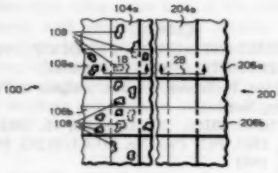
1. A process for chemically bonding a lubricant to an information carrying solid surface, said process characterized by contacting the surface with a diazoketone-terminated polymeric compound and decomposing said diazoketone-terminated polymeric compound to form a carbene which reacts with the solid surface.

4,446,194

DUAL LAYER PASSIVATION

Jon Candelaria, Mesa, Ariz., and Kurt S. Heidinger, Santa Clara, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 21, 1982, Ser. No. 391,047
Int. Cl.³ B05D *3/14*
U.S. Cl. 428—428 **12 Claims**



1. In a process for fabricating electronic devices wherein a first metal layer is formed on a first dielectric layer on a substrate, an interlayer dielectric is formed on said first metal layer, and a second metal layer is formed on said interlayer dielectric, the improvement comprising, forming said interlayer dielectric by depositing on said first metal layer a plasma derived oxide and overlying said plasma derived oxide with an other oxide formed by other means.

4,446,195

NOVEL POLYESTERS COATED ON CONDUCTIVE SUBSTRATE

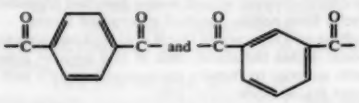
Werner Rieder, Vienna, Austria, and Martin Fehrle, Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Division of Ser. No. 375,204, May 5, 1982, Pat. No. 4,387,209. This application Mar. 2, 1983, Ser. No. 471,298
Claims priority, application Austria, Dec. 9, 1981, 5278/81; European Pat. Off., May 7, 1981, 81-890076.3
Int. Cl.³ B32B *27/06, 27/36*
U.S. Cl. 428—458 **14 Claims**

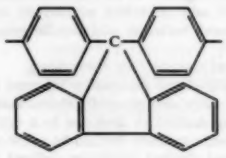
1. An electrical conductor provided with an electrically insulating layer of an organic, high-molecular weight polyester containing substantially chain members of the formula

—O—X—O—Y—

wherein X is at least one member of the group consisting of



and Y has the formula



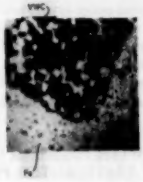
having an inherent viscosity of at least 1.0 dl/g measured at 30° C. in a solution of 0.5 g of the polyester in 100 ml of a mixture of 60% by weight of phenol and 40% by weight of 1,1,2,2-tetrachloroethane and whose films cast from a chlorinated organic solution have an elongation at break of at least 10% measured according to ASTM D-882-75 b with the proviso that if the inherent viscosity is between 1.0 and 1.5 dl/g, Y is a mixture of 70 to 30% of terephthalic acid and 30 to 70% of isophthalic.

4,446,196

HARD FACING COMPOSITION FOR IRON BASE ALLOY SUBSTRATE USING VC, W, MO, MN, NI AND CU AND PRODUCT

Harry J. Brown, Utica, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1982, Ser. No. 393,227
Int. Cl.³ B32B *9/04, 15/18;* B22F *7/04*
U.S. Cl. 428—544 **6 Claims**



1. In a method for hard facing a surface of an iron or iron base alloy substrate by forming a bond between said surface and a hard facing material, the improvement which comprises employing as a hard facing material a composition consisting essentially of grains of vanadium carbide having in solid solution from about 10 to 50% by weight tungsten and from about 1 to 4% by weight molybdenum, and containing from about 0.5 to 5% by weight manganese, from about 1 to 3% by weight nickel and from about 1 to 5% by weight copper in the grain boundaries.

4,446,197

ION BEAM DEPOSITION OR ETCHING RE RUBBER-METAL ADHESION

David A. Benko, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 23, 1982, Ser. No. 401,201
Int. Cl.³ B32B *15/06*
U.S. Cl. 428—625 **11 Claims**

1. A metal item having rubber adhered to a surface thereof, comprising:

the metal item, said metal surface treated by an ion beam treatment,
the rubber adhered to said treated metal surface.

4,446,198

COPPER-ZINC-IRON TERNARY ALLOY COATED STEEL WIRE REINFORCERS IN TIRES

Robert M. Shemenski, North Canton; Dong K. Kim, Akron, and Thomas W. Starinshak, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1983, Ser. No. 530,281
Int. Cl.³ B32B *15/18, 15/06*
U.S. Cl. 428—625 17 Claims

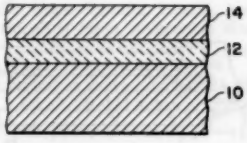
1. In a rubber article containing at least one steel reinforcing element wherein said steel reinforcing element is provided with an adhesive brass alloy coating, the improvement which comprises said brass alloy being a ternary iron-brass alloy consisting essentially of about 55 percent to about 75 percent copper by weight, about 0.1 percent to about 10 percent iron by weight, and about 15 percent to about 45 percent zinc by weight.

4,446,199

OVERLAY METALLIC-CERMET ALLOY COATING SYSTEMS

Michael A. Gedwill, North Olmsted; Stanley R. Levine, and Thomas K. Glasgow, both of Rocky River, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,378
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—639 8 Claims



1. A coated article of manufacture comprising
a substrate selected from the group consisting of nickel-base alloys and cobalt-base alloys,
a cermet layer of an oxide dispersed metallic alloy having nominal composition in weight percents of about 11% to about 17% chromium, about 6% to about 10% aluminum, about 0.3% to about 0.5% yttrium, and the remainder nickel containing about 9% to about 40% yttrium oxide covering said substrate, said dispersed oxide comprising between about 10 and about 75 volume percent of said cermet layer, and
a protective coating of an alloy selected from the group consisting of nickel-, cobalt-, and iron-base alloys covering said cermet layer.

4,446,200

METALLURGICAL COATING SYSTEM

Larry C. Daniels, and Gary S. Whittaker, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,491
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—661 8 Claims

1. A metallurgical coating system which provides improved corrosion resistance comprising
(a) a first layer comprising tantalum which is deposited under a substrate; and
(b) a second layer comprising molybdenum disilicide which is deposited upon said first layer.

8. A metallurgical coating system which provides improved corrosion resistance comprising
(a) a nickel base alloy having a molybdenum content of at least about 5% by weight;
(b) a first coating layer deposited upon said substrate at a thickness less than about 5μ, said first layer comprising tantalum; and
(c) a second coating layer deposited upon said first layer at a thickness of about 10 to 25μ, said second layer comprising molybdenum disilicide.

4,446,201

TRANSITION METAL ALUMINATES SUPPORTED ON A SUBSTRATE

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 362,690, Mar. 29, 1982, Pat. No. 4,392,980. This application May 13, 1983, Ser. No. 494,192
Int. Cl.³ B01D *15/04*
U.S. Cl. 428—696 10 Claims

1. Crystalline transition metal aluminates conforming generally to the formula

$$MA_a^vZ_b^v.nAl(OH)_3.mH_2O$$

where M is at least one divalent transition metal selected from the group comprising Cu, Zn, Mn, Fe, Co, and Ni,
where AZ represents negative valence ions or radicals,
n is a value of from 1 to about 4,
v is a negative valence of 1, 2, or 3,
a and b are each values of from zero to 2,
with (va)+(vb) equal to 2, and with m being a value of zero or more,
said aluminate being supported on a substrate.

4,446,202

PROCESS FOR RENDERING NON-THERMOPLASTIC FIBROUS MATERIALS FLAME RESISTANT TO MOLTEN MATERIALS BY APPLICATION THERETO OF A FLAME RESISTANT COMPOSITION, AND RELATED ARTICLES AND COMPOSITIONS

Vladimir Mischutin, East Brunswick, N.J., assignor to White Chemical Corporation, Bayonne, N.J.

Continuation-in-part of Ser. No. 31,307, Apr. 18, 1979, Pat. No. 4,348,306, which is a division of Ser. No. 797,767, May 17, 1977, Pat. No. 4,158,073, which is a division of Ser. No. 538,896, Jan. 6, 1975, abandoned, which is a division of Ser. No. 300,732, Oct. 25, 1972, abandoned. This application May 21, 1981, Ser. No. 266,000
Int. Cl.³ B32B *9/02*
U.S. Cl. 428—254 42 Claims

1. A process for rendering a non-thermoplastic fiber or fibrous composition flame resistant when contacted with a hot molten material, that comprises applying to said fiber or fibrous compositions, a flame retardant composition comprising water, a water-insoluble, non-phosphorus containing brominated aromatic or cycloaliphatic containing organic compound, and a metal oxide, or mixtures of said oxide and a metal hydrate, and curing said flame retardant composition on said fibers or fabric.

4,446,203

ASBESTOS-FREE FRICTION MATERIALS

Howard S. Okubo, Chicago; Clarence E. Albertson, Villa Park, and Roger K. Nibert, Hoffman Estates, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,195
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 7 Claims

1. An asbestos-free friction material having good friction stability and wear properties consisting essentially of an aromatic polyamide fiber, a binder, from about 3 to about 15 parts of antimony sulfide and from about 7 to about 30 parts of copper oxide.

4,446,204

SECURITY PAPER WITH AUTHENTICITY FEATURES

Wittich Kaule, Gauting; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH., Munich, Fed. Rep. of Germany

PCT No. PCT/DE81/00082, 371 Date Oct. 23, 1981, 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/03511, PCT Pub. Date Dec. 10, 1981
PCT Filed May 29, 1981, Ser. No. 314,841
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020653
Int. Cl.³ B32B 5/16; G06K 9/74
U.S. Cl. 428—323 14 Claims

1. A security document with authenticity features, comprising: a carrier material having a known infra-red absorption characteristic; and a coloring agent having magnetic properties for enabling magnetic verification of said security document to be conducted, said coloring agent having an infra-red absorption characteristic such that in at least one given spectral region said coloring agent absorbs infra-red radiation less than or substantially to the same extent as said carrier material.

4,446,205

MAGNETIC RECORDING TAPE HAVING A LEADER TAPE

Chiaki Mizuno; Yasuo Tamai, and Nobuo Tsuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1982, Ser. No. 447,582
Claims priority, application Japan, Dec. 7, 1981, 56-196675
Int. Cl.³ G11B 5/70; B32B 5/16
U.S. Cl. 428—327 11 Claims

1. A leader tape, comprising:

a support base; and

a cleaning layer coated on a surface of the support base, cleaning layer comprising a binder having dispersed therein an organic thermoplastic high molecular powder having a particle size of 0.1 to 20 μm and an organic thermosetting high molecular powder having a particle size of 0.1 to 10 μm, the leader tape having a light percent transmittance of 20% or more.

11. A magnetic recording tape having a leader tape at its end, the leader tape comprising a support base having on a surface thereof a cleaning layer comprising a binder having dispersed therein an organic thermoplastic high molecular powder having a particle size of 0.1 to 20 μm and an organic thermosetting high molecular powder having a particle size of 0.1 to 10 μm, the leader tape having a light percent transmittance of 20% or more.

4,446,206

SET POLYACRYLONITRILE FILAMENTS AND FIBERS, AND A PROCESS FOR THEIR PRODUCTION

Walter Fester, Königstein, and Bernd Huber, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,233
Claims priority, application Switzerland, Mar. 20, 1981, 1918/81
Int. Cl.³ D02G 3/00; D01D 5/12
U.S. Cl. 428—364 1 Claim

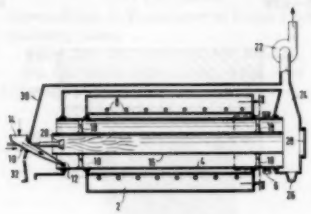
1. A filament or fiber of acrylonitrile polymers, comprising a filament-forming substance which is composed to at least 98% by weight of acrylonitrile units and the relative viscosity of which is within a range between 2.5 and 6.0, and having a tensile strength of more than 50 cN/tex, a shrinkage at the boil of less than 5%, an elongation at break of at most 15% and an initial modulus greater than 900 cN/tex after an aqueous alkaline treatment at 90° C. for 24 hours.

4,446,207

SPHERICAL BALLS AND THEIR MANUFACTURE

Jean Dewitte, Boulogne, and Pierre Aymard, Paris, both of France, assignors to Saint-Gobain Industries, France

Continuation of Ser. No. 126,116, Feb. 29, 1980, abandoned, which is a division of Ser. No. 24,090, Mar. 26, 1979, Pat. No. 4,201,560. This application Dec. 16, 1981, Ser. No. 331,390
Claims priority, application France, Mar. 31, 1978, 78 09544
The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.
Int. Cl.³ B32B 5/16
U.S. Cl. 428—402 4 Claims



1. A product formed of a particulate ceramizable glass material having a granular dimension of about 1 to about 3.5 mm and a substantially rounded, spherical shape by a thermal treatment within a temperature range of from about 950° to about 1200° C., said material having a crystallization rate of at least 30%, essentially in the form of wollastonite α and β, and a resistance to crushing of at least 4,000 bars.

4,446,208

EXPANDABLE POLYSTYRENE COMPOSITION AND PROCESS

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 489,973, Apr. 29, 1983. This application Jul. 22, 1983, Ser. No. 516,070
Int. Cl.³ B32B 5/16; C08J 9/22
U.S. Cl. 428—407 2 Claims

1. Expandable polystyrene beads exhibiting reduced adhesion to one another comprising expandable polystyrene beads containing a volatile blowing agent, said beads being coated with an anti-adhesion composition comprising effective amounts of magnesium stearate and zinc stearate respectively, wherein, (a) the effective amount of magnesium stearate is from about 50 gms. to about 40 gms. per 1,000 lbs. of expandable polystyrene beads; and (b) the effective amount of zinc

stearate is from about 50 gms. to about 500 gms. per 1,000 lbs. of expandable polystyrene beads.

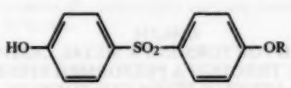
4,446,209

HEAT-SENSITIVE RECORDING MATERIALS

Ken Iwakura, Kanagawa, and Takekatsu Sugiyama, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1982, Ser. No. 440,659
Claims priority, application Japan, Nov. 11, 1981, 56-180634
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—216 **4 Claims**

1. A heat-sensitive recording material, comprising:
an electron donating colorless dye; and
an electron accepting compound represented by the general formula (I):



(I)

wherein R is an alkyl group having at least 4 carbon atoms, an aralkyl group, a aryl group, an alkylcarbonyl group, an arylcarbonyl group, an alkylsulfonyl group or an arylsulfonyl group.

4,446,210

FUEL CELL ELECTRODE

Hideo Okada; Jinichi Imahashi, both of Hitachi; Seizi Takeuchi, Hitachiota; Sigeru Okabe, Hitachi; Toshiki Kahara; Kenzo Ishii, both of Ibaraki; Masato Takeuchi, Katsuta; Shimpei Matsuda, Ibaraki; Kohki Tamura, Hitachi, and Hiroshi Tobita, Kitaibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,768
Claims priority, application Japan, Apr. 8, 1981, 56-51816
Int. Cl.³ H01M *4/86*
U.S. Cl. 429—42 **23 Claims**

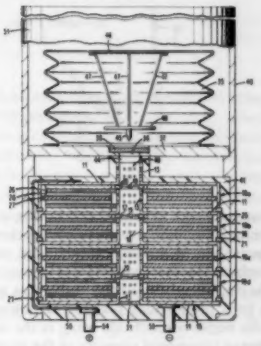
1. A fuel cell electrode, adapted to have a side thereof facing an electrolyte, which comprises a gas-diffusing electroconductive substrate in a sheet form with continued pores and a catalyst layer consisting essentially of a mixture of electroconductive submicron particles having a catalyst, electroconductive materials each having a volume 10^3–10^{10} as large as the volume of the largest particle of the submicron particles and a binder, the catalyst layer being provided at the electrolyte-facing side of the electroconductive substrate, the catalyst layer being made water-repellant at least at the electrolyte side, the electroconductive submicron particles and the electroconductive materials being provided in a mixing ratio by volume of the former to the latter of 95–50 to 5–50, whereby generation of cracks on the catalyst layer at drying or baking of the catalyst layer after application of catalyst to the electroconductive substrate is substantially prevented.

4,446,211

RESERVE ELECTROCHEMICAL BATTERY

Franz Goebel, Sudbury, and Morton A. Slavin, Marblehead, both of Mass., assignors to GTE Communications Products Corporation, Stamford, Conn.

Filed May 13, 1983, Ser. No. 494,152
Int. Cl.³ H01M *6/36*
U.S. Cl. 429—101 **12 Claims**



1. A reserve battery of electrochemical cells comprising
a plurality of similar housing sections of conductive material arranged in series;
each housing section being electrically insulated from adjacent housing sections;
each two adjacent housing sections forming a chamber between them;
each chamber containing
an anode electrode member of an electrochemical system, and
a cathode electrode member of an electrochemical system,
the anode electrode member being in electrical contact with the housing section of one of the housing sections forming the chamber, and
the cathode electrode member being in electrical contact with the housing section of the other of the housing sections forming the chamber;
portions of said housing sections forming a conduit;
each housing section having an opening in said portion providing passageways between the conduit and each of said chambers;
reservoir means containing a fluid constituent of an electrochemical system, said fluid constituent, a said anode electrode member, and a said cathode electrode member providing a complete electrochemical system of an electrochemical cell;
rupturable sealing means sealing said reservoir means from said conduit;
activating means operable when actuated to rupture said rupturable sealing means and force said fluid constituent in the reservoir means into said conduit and through said passageways into said chambers; and
valve means for sealing the fluid constituent within each chamber from the fluid constituent within each of the other chambers
whereby when said activating means is actuated a battery of active individual electrochemical cells arranged in series is provided with each housing section serving as the positive terminal for the electrochemical system within one chamber and the negative terminal for the electrochemical system within an adjacent chamber.

4,446,212

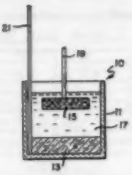
ELECTROCHEMICAL CELL

Thomas D. Kaun, New Lenox, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 287,857, Jul. 29, 1981, Pat. No. 4,358,513. This application Nov. 8, 1982, Ser. No. 440,203

Int. Cl.³ H01M 4/36

U.S. Cl. 429—103 17 Claims



1. A secondary electrochemical cell having a negative electrode of lithium aluminum, a positive electrode of iron sulfide, a molten electrolyte of lithium chloride and potassium chloride, the combination therewith of the negative and positive electrodes having quantities of the respective materials forming same in such proportions that the full charge theoretical capacity of the negative electrode being in the range of 0.5–1.0 of the full charge theoretical capacity of the positive electrode, whereby the cell capacity is limited by the negative electrode capacity during discharge cycling, and the negative electrode containing in the approximate range of 1–10 volume % of the electrode an additive from the group of materials including graphitized carbon, Raney iron and magnesium oxide.

4,446,213

ELECTROCHEMICAL STORAGE CELL

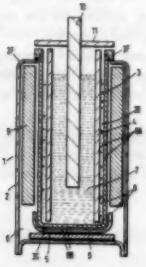
Günther Steinleitner, Schriesheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,239

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117619

Int. Cl.³ H01M 4/36

U.S. Cl. 429—104 17 Claims



1. An electrochemical storage cell or battery of alkali metal and chalcogen comprising at least one anode space receiving the alkali metal anolyte and one cathode space receiving the chalcogen catholyte, an alkali ion-conducting solid electrolyte separating the said reactant spaces from each other, said cell bounded at least in some places by a metallic housing, and a safety space subdivided into at least two safety zones adjoining said solid electrolyte, wherein a first safety zone of said two safety zones is arranged in the anode space parallel to the lateral boundary surfaces of the solid electrolyte and bounded by a support element shaped as a tube open at its bottom also arranged in the anode space, and a second safety zone of said two safety zones is arranged in the cathode space parallel to the closed end of the solid electrolyte and bounded by a casing shaped as a cap also arranged in the cathode space and that the distance between the solid electrolyte, the support element and the casing is at most 1 to 2 mm.

4,446,214

METHOD FOR FORMING A METAL CASTING EXTENDING THROUGH A PREFORMED STRUCTURE AND ARTICLES PRODUCED THEREBY

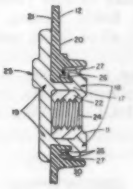
Verlin A. Mocas, Indianapolis, Ind., assignor to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 014,829, Feb. 26, 1979, Pat. No. 4,299,891, which is a continuation of Ser. No. 527,726, Nov. 27, 1974, Pat. No. 4,413,215, which is a division of Ser. No. 301,568, Oct. 27, 1972, Pat. No. 3,874,933. This application Nov. 5, 1981, Ser. No. 318,435

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.³ H01M 2/30

U.S. Cl. 429—179 10 Claims



1. A method of forming a metal casting which extends within and through a wall of a preformed structure fabricated of a thermally deformable material, said casting extending between the interior and exterior of such preformed structure, which method comprises;

providing a wall of such preformed structure with a port of preformed configuration adapted for receiving and holding a metal casting;

injecting a molten metal into such port and within a die mold cavity positioned about the port to shape the molten metal into a metal casting of a unitary member having the desired shape, the port in conjunction with the die mold cavity initially acting as a mold for the molten metal;

controlling the temperature of the molten metal so that said molten metal freely flows to form the desired shape of the metal casting and solidifies without destroying the structure or composition of such port and wall and, upon cooling, acts as a mold for any molten portions of the thermally deformable material to preserve the preformed configuration of said port; and,

recovering the preformed structure with the solidified metal casting extending within and through the wall in the desired shape and providing a fluid tight seal about the metal casting between the interior and exterior of the preformed structure.

4,446,215

ELECTROCHEMICAL GENERATOR COMPRISING AN AMMONIATE

Janine Badoz, Paris; Michelle Bardin, Sucy-en-Brie; Claude Bernard, Saint Vit; Michel Herlem, Versailles; Guy Robert, Morre, and André Thiebault, Paris, all of, France, assignors to Electricite de France (Service National), Paris, France

Filed Jun. 15, 1983, Ser. No. 504,485

Claims priority, application France, Jun. 16, 1982, 82 10488; Feb. 22, 1983, 83 02849

Int. Cl.[3] H01M 6/14

U.S. Cl. 429—190 22 Claims

1. An electrochemical generator of the type comprising an anode consisting of a highly reducing metal or a highly reducing metallic alloy, a cathode consisting of a reducible material, together with a practically water-free liquid or solid electrolyte, in which the anode and the cathode are immersed, characterised in that the said electrolyte consists of at least one ammoniate of at least one salt of a cation of the anode metal or of a salt of a cation of a more highly reducing metal than the anode metal or metals.

4,446,216

PHOTOGRAPHIC MATERIAL

Norman A. Smith, Hornchurch; Stephen R. Postle, and William E. Long, both of Brentwood, all of England

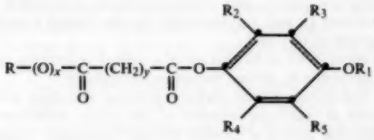
Filed Nov. 23, 1982, Ser. No. 444,022

Claims priority, application United Kingdom, Dec. 10, 1981, 8137239

Int. Cl.[3] G03C 5/24, 1/02

U.S. Cl. 430—405 11 Claims

1. Photographic material which comprises in at least one silver halide emulsion layer or a layer or layers adjacent thereto at least one substituted hydroquinone compound of the formula



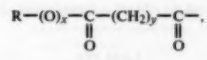
where

R is hydrogen or optionally substituted methyl or ethyl, aryl or a heterocyclic group, R_2, R_3, R_4 and R_5 are each hydrogen,

x is 0 or 1,

y is 0 or 1,

and R_1 is hydrogen or a group of the formula



with the proviso that if R is methyl only one of x and y can be 0.

4,446,217

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING A HYDRAZONE CONTAINING LAYER

Yoshio Takasu, Tama, and Shozo Ishikawa, Sayama, both of Japan, assignors to Canon Kabushiki Kaisha and Copyer Kabushiki Kaisha, both of Tokyo, Japan

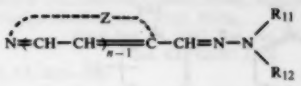
Filed Jan. 27, 1982, Ser. No. 343,187

Claims priority, application Japan, Feb. 3, 1981, 56-14515; Mar. 19, 1981, 56-40145; May 20, 1981, 56-75973

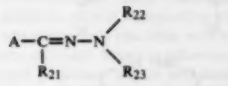
Int. Cl.[3] G03G 5/06

U.S. Cl. 430—58 27 Claims

1. An electrophotographic photosensitive member comprisng a layer containing a hydrazone compound represented by the following formula (1) or (2):



Formula (1)



Formula (2)

wherein, Z is an atomic group necessary to complete a substituted or unsubstituted heterocyclic ring; selected from the group consisting of thiazoline, oxazoline, imidazoline, thiazole, oxazole, imidazole, benzothiazole, benzoxazole, benzimidazole, naphthothiazole, naphthoxazole, naphthoimidazole, quinoline, isoquinoline, quinoxaline, pyridazine, pyrimidine, pyrazine, triazole, oxadiazole, and thiadiazole; R_{21}, R_{22} and R_{23} represent substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl, and the combinations of R_{11} with R_{12} and of R_{22} with R_{23} can form each a pyrrolidine ring, piperidine ring, or morpholine ring; n is 1 or 2, and A is a monovalent heterocyclic ring residue.

4,446,218

SULFUR AND/OR AMIDE-CONTAINING EXPOSURE ACCELERATORS FOR LIGHT-SENSITIVE COATINGS WITH DIAZONIUM COMPOUNDS

Major S. Dhillon, Hillsborough, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 18, 1982, Ser. No. 359,629

Int. Cl.[3] G03C 1/58, 1/60, 1/54

U.S. Cl. 430—175 16 Claims

1. A composition comprising a light sensitive diazonium compound and an accelerator selected from the group consisting of 1,1-thiobis(2-naphthol), diresorcinol sulfide, diphenyl sulfone, phenothiazine, dibenzothiophene sulfone, N-(3-hydroxyphenyl)-2-hydroxy-3-naphthamide, 2,3-dihydroxy naphthoic acid ethanolamide, N,N'-ethylene-bis-acetoacetamide, 4-bromo-3,5-resorcyclic acid ethanolamide, 3,5-resorcyclic acid ethanolamide 2,4-resorcyclic acid ethanol amide, acetoacetbenzylamide, 2-mercaptobenzothiazole, and 2-benzoxazolethiol, wherein said diazonium compound is selected from the group consisting of the condensation products of Formula I, Formula II and Formula IV as set forth herein such that said accelerator is present in said composition in an amount from about 0.005 to about 1.5 parts by weight of accelerator per part by weight of said diazonium compound.

4,446,219

PHOTOGRAPHIC MATERIAL COMPRISING A LAYER WITH NI COMPLEX OF 2,2'-BISPHENOL

Peter Bergthaller, and Jürgen Strauss, both of Cologne, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,307

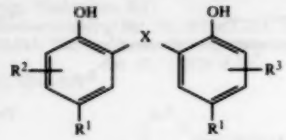
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 31323332

Int. Cl.[3] G03C 1/40, 5/54, 7/00

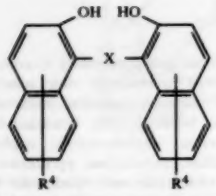
U.S. Cl. 430—216 5 Claims

1. A photographic material comprising a layer capable of being dyed by organic dyes and containing a metallizing agent for the formation of organic dye-metal complexes arranged on a layer support, said dyeable layer also containing a mordant for diffusible anionic dyes or being in direct contact with a mordant layer containing a mordant for diffusible anionic dyes, wherein said dyeable layer contains dispersed in a hydrophilic binder, as metallizing agent, a water-insoluble nickel complex

formed from a 2,2'-bisphenol corresponding to one of the following general formulae I and II:



I



II

wherein

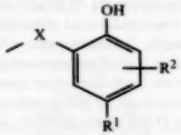
X denotes —S—,

or $—SO_2—$;

R^1 denotes a hydrocarbon group having up to 18 C—atoms attached either directly or through —O—, or it denotes a halogen or a group R^4;

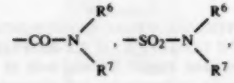
R^2 denotes hydrogen, halogen, alkyl or alkoxy with up to 18 C-atoms, alkenyl, a residue for completing a condensed benzene ring; or a group R^4 if R^1 does not denote a group R^4;

R^3 denotes a residue as defined for R^2 or a group corresponding to the formula



wherein X, R^1 and R^2 have the meaning indicated above;

R^4 denotes —CO—O—R^5,



—NH—CO—R^8 or —NH—SO_2R^9;

R^5 denotes alkyl, aralkyl or cycloalkyl having up to 8 C-atoms;

R^6 and R^7 denote hydrogen, alkyl, aralkyl, aryl or cycloalkyl or together denote a residue for completing a 5-, 6- or 7-membered cyclic amino group;

R^8 denotes alkyl, aralkyl, aryl, OR^5 or

and

R^9 denotes alkyl, aryl or

4,446,220

METHOD OF MAKING A PHOTOSENSITIVE ELASTOMERIC COMPOSITION

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 304,371, Sep. 21, 1981. This application Aug. 27, 1982, Ser. No. 412,090

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.[3] **G03C** *1/68*

U.S. Cl. 430—286 **6 Claims**

1. A method for preparing a photosensitive, elastomeric composition developable in aqueous base/organic solvent mixtures comprising, by total weight of the composition,

(i) about 40 to 90 percent of a heat workable mercaptocarboxylic acid-modified polymer of a diene selected from at least one member of the group butadiene and isoprene, said polymer characterized by having

(a) a number average molecular weight of about 15,000 to 1,000,000,

(b) a carboxyl content of about 1 to 15 percent by weight of polymer (i),

(c) at least about 0.7 percent of sulfur, by weight of polymer (i),

(ii) about 2 to 50 percent of a nonaqueous, ethylenically unsaturated compound containing at least one terminal ethylenic group, said compound being compatible with polymer (i) and polymerizable by the radical generating system of (iii), and

(iii) about 0.001 to 10 percent of a radical generating system activatable by actinic radiation; comprising

(A) heat mixing a heat workable polymer of a diene selected from at least one member of the group butadiene and isoprene having a number average molecular weight of about 15,000 to 1,000,000 with a mercaptocarboxylic acid for a time sufficient to modify the polymer so that it contains characteristics (a), (b) and (c); and

(B) mixing the modified polymer made in step (A) with a nongaseous, ethylenically unsaturated compound containing at least one terminal ethylenic group, said compound being compatible with the modified polymer and being polymerizable by a radical generating system, and a radical generating system activatable by actinic radiation, for a time sufficient to obtain a homogeneous composition.

4,446,221

ANODIZED SUPPORTS AND RADIATION SENSITIVE ELEMENTS THEREFROM

Hans P. Herting, Osterode, Fed. Rep. of Germany; Jen-Chi Huang, Ossining, and Eugene Golda, Monsey, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 263,961, May 15, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,661

Int. Cl.[3] **G03F** *7/02*

U.S. Cl. 430—302 **2 Claims**

1. In a method for preparing a lithographic printing plate comprising the steps of,

I. exposing a radiation-sensitive element comprising an improved anodized support material of aluminum or an aluminum alloy having coated thereupon a radiation-sensitive composition to radiation through a mask; and

II. developing the exposed element to remove the areas of greater solubility to produce the desired plate;

the improvement comprises treating an anodized support material with an aqueous solution of an alkali metal salt of a condensed arylsulfonic acid having an acidic pH prior to coating with said radiation-sensitive composition, said treatment being effected at a temperature of from about room temperature to 50° C. during or after anodization said arylsulfonic acid having two or more arylsulfonic acid nuclei joined by alkylene groups.

4,446,222

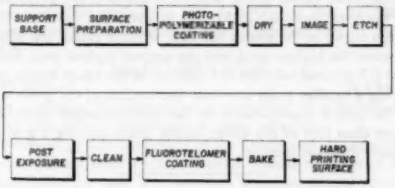
METHOD OF PREPARING PRINTING SURFACE FORMED OF POLYMERIC RESIN CONTAINING POLYAMIDE AND DICARBOXYLIC ACID DIESTER

David R. Kress, Rochester, N.Y., assignor to Matrix Unlimited, Inc., Rochester, N.Y.

Division of Ser. No. 249,070, Mar. 30, 1981, Pat. No. 4,345,022, which is a division of Ser. No. 93,622, Nov. 13, 1979, Pat. No. 4,269,930. This application Jun. 21, 1982, Ser. No. 390,175

Int. Cl.³ G03C 5/00

U.S. Cl. 430—307 **8 Claims**



1. A process for preparing a hard printing surface comprising:

a. coating a base with a mixture of alcohol and a photopolymerizable composition of matter comprising:

(1) from about 70–95% by weight of an alcohol-soluble linear polyamide;

(2) from about 0.5–15% by weight of a low molecular weight dicarboxylic acid diester selected from the group consisting of saturated and unsaturated dicarboxylic acid diesters having up to eight carbon atoms in the acid backbone and up to about four carbon atoms in the alcohol moiety appended at the ester linkage; and

(3) an effective amount of at least one photosensitizer and at least one polymerization inhibitor;

b. drying the coating;

c. exposing the coating to actinic light through a photographic element to selectively photopolymerize the coating; and

d. etching the unexposed portions of the coating.

4,446,223

RECORDING AND INFORMATION RECORD ELEMENTS COMPRISING OXOINDOLIZINE AND OXOINDOLIZINIUM DYES

Donald H. Wadsworth; Harold T. Thomas, both of Rochester; George L. Fletcher, Pittsford, and Charles H. Weidner, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,769

Int. Cl.³ G03C 1/52

U.S. Cl. 430—338 **5 Claims**

1. An optical recording element comprising a support having coated thereon a layer of an amorphous composition (a) having an absorption factor of at least 20 and (b) comprising a binder and a dye selected from the group consisting of oxoindolizine and oxoindolizinium dyes.

4,446,224

TELLURIUM IMAGING COMPOSITION INCLUDING ALCOHOL

Terry T. Yu, Macomb County, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 28, 1982, Ser. No. 392,580

Int. Cl.³ G03C 5/24

U.S. Cl. 430—346 **33 Claims**

1. A film for forming an image made from a composition applied to a substrate, which composition comprises:

(a) a tellurium compound reactible with a diol and an alcohol to form an image forming tellurium compound;

(b) a reductant precursor which will abstract labile hydrogen from a hydrogen donor under the influence of activating energy to become a reducing agent with respect to the image forming tellurium compound;

(c) a diol reactible with said tellurium compound and an alcohol to form an image forming tellurium compound;

(d) a source of labile hydrogen for reaction with said reductant precursor, said source of labile hydrogen comprising said diol;

(e) an alcohol reactible with said tellurium compound and diol to form an image forming tellurium compound, said alcohol of the formula:

where R_1, R_2 and R_3 each and independently are selected from the group consisting of hydrogen, alkyl, alkenyl, phenyl, benzyl, alkylphenyl, alkylbenzyl, alkoxyphenyl, alkenylphenyl and alkenylbenzyl, said alcohol being of the type and present in an amount such that the speed of the film is improved; and

(f) a matrix in which said tellurium compound, reductant precursor, labile hydrogen, diol and alcohol are combined in amounts effective to form a composition which may be applied to a substrate.

4,446,225

METHOD FOR PROCESSING COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shinzo Kishimoto, and Kiyohiko Yamamuro, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

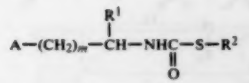
Filed Mar. 25, 1983, Ser. No. 478,942

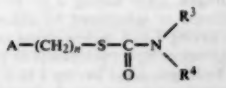
Claims priority, application Japan, Mar. 25, 1982, 57-47821

Int. Cl.³ G03C 7/00

U.S. Cl. 430—393 **6 Claims**

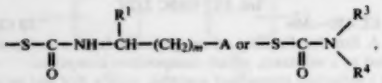
1. A method for processing a color photographic light-sensitive material by subjecting an exposed silver halide color photographic light-sensitive material to a color development processing then to a bleaching processing and a fixing processing or to a bleach-fixing processing, which process comprises incorporating at least one compound represented by the following general formula (I-a) or (I-b) in a bath of said bleaching or bleach-fixing processing or in a pre-bath thereof:


(I-a)


(I-b)

wherein A represents an amino group which is optionally

substituted or a nitrogen-containing hetero ring residue which may be optionally substituted, R^1 represents a hydrogen atom or a carboxy group, R^2 represents a monovalent metal atom, an ammonium group, an optionally substituted alkyl group or a group represented by



R^3 and R^4 each represents a hydrogen atom or an alkyl group which may be substituted by a hydroxy group, an alkoxy group, a halogen atom, a carboxyl group, $-SO_2H$, $-SO_3H$, or a group represented by A described above, m represents 1 or 2, and n represents an integer of 2 to 4.

4,446,226

LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Kiyoshi Yamashita, and Toshifumi Iijima, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,083

Claims priority, application Japan, Jul. 10, 1981, 56-106908; Dec. 11, 1981, 56-200477; Dec. 12, 1981, 56-200611; Dec. 13, 1981, 56-200552

Int. Cl.³ G03C *1/46, 7/26*

U.S. Cl. 430—506 **9 Claims**

1. A light-sensitive color photographic material having a support and, coated thereon, at least two light-sensitive silver halide emulsion layers respectively sensitive to light of a different spectral region, each of said emulsion layers comprising at least two light-sensitive emulsion sublayers having different sensitivity to light and containing negative type light-sensitive silver halide crystals consisting essentially of silver iodobromide containing silver iodide in an amount of from 1 to 3 mole %.

4,446,227

DYESTUFFS AND THEIR USE IN PHOTOGRAPHIC MATERIAL

William E. Long, Brentwood, United Kingdom, assignor to Ciba-Geigy AG, Basel, Switzerland

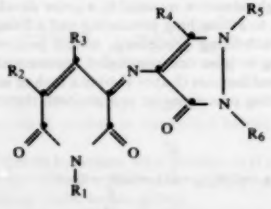
Division of Ser. No. 236,488, Feb. 23, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,538

Claims priority, application United Kingdom, Feb. 28, 1980, 8006849

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—513 **4 Claims**

1. A silver halide photographic material which comprises in at least one layer thereof at least one dyestuff of the formula



where R_1 is hydrogen, alkyl having 2 to 10 carbon atoms which is unsubstituted or substituted by chlorine, bromine, hydroxyl, alkoxy having 1 to 4 carbon atoms or a carboxylic acid (—COOH) group, or R_1 is cyclopentyl or cyclohexyl, R_2 and R_3 are each hydrogen, alkyl having 1 to 8 carbon atoms which is unsubstituted or substituted by hydroxyl, a carboxylic acid (—COOH) group, cyano or nitro, or R_2 and R_3 are each a carboxylic acid (—COOH) group, a carboxylic ester group having 2 to 5 carbon atoms, a carboxylic amide ($—CONH_2$) group or cyano, and R_4, R_5 and R_6 are each alkyl having 1 to 6 carbon atoms which is unsubstituted or substituted by chlorine, bromine, hydroxyl, alkoxy having 1 to 4 carbon atoms or a carboxylic acid (—COOH) group, or R_4, R_5 and R_6 are each phenyl which is unsubstituted or substituted by chlorine, bromine, hydroxyl, cyano, nitro or a carboxylic acid (—COOH) group.

4,446,228

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Chika Honda, Hino; Masatoshi Iwata, Akishima, and Takeo Koitabashi, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 27, 1982, Ser. No. 372,128

Claims priority, application Japan, Apr. 28, 1981, 56-63281

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **4 Claims**

1. An X-ray silver halide photographic material comprising a base having formed thereon a silver halide emulsion layer substantially made of two or more monodispersed emulsions having silver halide grains with different average grain sizes in the range of about 0.2 to 3.0 μm, wherein the grain size distribution curve of the grains has two or more peaks, the distance between the highest peak and the second highest peak being at least 0.3 μm and wherein the number of the silver halide grains having a smaller grain size than the median of the grain size of all the grains incorporated in the monidispersed emulsions is larger than that of the silver halide grains having a grain size greater than the median.

4,446,229

METHOD OF TISSUE GROWTH

Robert B. Indech, 55 Pilgrim Rd., Melrose, Mass. 02176

Filed Dec. 30, 1982, Ser. No. 434,961

Int. Cl.³ A01N *1/02*; C12M *3/00*

U.S. Cl. 435—1 **7 Claims**

1. A method of growing tissue allowing vasular ingrowth whereby living tissue is grafted onto a non-immunoreactive mesentary, said mesentary having an arterial and venous system, said arterial and venous system is anastomosed to a tube completing a closed fluid circuit, said tube containing a solution allowing oxygen and carbon dioxide transport of a sufficient quantity for continued growth of said mesentary and said tissue, said tube is connected to a pump to unidirectionally propel said solution, said tube is connected to an artificial lung consisting substantially of a gaseous exchange membrane and a circulated supply of oxygen, said tube is connected to an artificial kidney consisting substantially of an exhange membrane and a circulated supply of dialysate, said tube is connected to an output port and an input port, and whereby a complete system comprising said mesentary, said tissue, said tube, said solution, said pump, said artificial lung, said artificial kidney, said output port, and said input port is contained in a temperature controlled, humidity controlled antiseptic housing.

4,446,230

TEST METHOD FOR THE LABORATORY DIAGNOSIS OF GONORRHEA AND TEST STRAIN OF *NEISSERIA GONORRHOEAE*

Leonard J. Zubrzycki, Pennsauken, N.J., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Oct. 30, 1981, Ser. No. 317,023

Int. Cl.³ C12Q *1/68, 1/04, 1/12*; C12N *1/20*

U.S. Cl. 435—6 **16 Claims**

1. A biologically pure culture of the microorganism *Neisseria gonorrhoeae* ATCC 31953 capable of taking up gonococcal DNA, but which microorganism is abnormal in that it has characteristically poor growth on common chocolate agar at a

temperature within the range of from about 30° C. to about 37° C. in a CO_2 atmosphere suitable for growth of normal *Neisseria gonorrhoeae*, and said microorganism having resistance to nalidixic acid and streptomycin at the 5–10 mcg/ml level and the 1000 mcg/ml level or greater, respectively.

4. The method for the laboratory diagnosis of gonorrhea by detecting DNA of *Neisseria gonorrhoeae* in a patient's specimen material, comprising the steps of (1) applying a non-toxic preparation of a patient's specimen material, directly to a culture of *Neisseria gonorrhoeae* ATCC 31953, which has abnormal growth characteristics, which is in or on a biological medium suitable for growth of normal *Neisseria gonorrhoeae*, and (2) observing for the restoration of normal growth to the abnormal growth strain *Neisseria gonorrhoeae* ATCC 31953, in or on the biological medium of step (1), under conditions normal for growth of *Neisseria gonorrhoeae*.

4,446,231

IMMUNOASSAY USING AN AMPLIFIED CYCLIC DETECTION SYSTEM

Colin H. Self, 46 Lensfield Rd., Cambridge, CB2 1EG, England

Continuation-in-part of Ser. No. 193,647, Oct. 3, 1980, abandoned. This application Oct. 1, 1981, Ser. No. 307,600

Claims priority, application United Kingdom, Oct. 3, 1979, 7934376

Int. Cl.[3] **G01N** *33/54*

U.S. Cl. 435—7 **21 Claims**

1. In a method for determining a member of a ligand and receptor pair which comprises an assay wherein:

(a) a sample of a first member of the ligand and receptor pair is contacted with a matrix bound second member of the pair whereby said first member becomes bound to said second member:

(b) the thus produced matrix bound first member is contacted with a conjugate which binds specifically to the matrix bound first member which conjugate comprises a phosphatase whereby said phosphatase is bound to the matrix and

(c) the matrix bound and unbound conjugate are separated and the matrix bound or the unbound conjugate is assayed; the improvement which comprises:

(d) contacting the conjugate to be assayed with a precursor for NAD whereby NAD is produced, and

(e) contacting the thus produced NAD with the components of a secondary system which is activated by the NAD, said secondary system comprising a cyclic chemical reaction which interconverts NAD and NADH, neither of which is present until the production of NAD by the conjugate, and which secondary system maintains the increase in concentration of NAD produced by the conjugate and produces a determinable change, said components of the cyclic chemical reaction being present in sufficient quantity to maintain the cyclic chemical reaction and produce determinable product at each turn of the cycle whereby amplification of the determinable change occurs.

4,446,232

ENZYME IMMUNOASSAY WITH TWO-ZONED DEVICE HAVING BOUND ANTIGENS

Lance A. Liotta, 5621 Sonoma Rd., Bethesda, Md. 20817

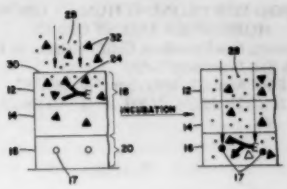
Filed Oct. 13, 1981, Ser. No. 310,801

Int. Cl.[3] **G01N** *33/54, 33/58, 33/52, 33/76*

U.S. Cl. 435—7 **23 Claims**

13. A method for determining the presence of antigens in a biological fluid which comprises:

bringing a fluid which is to be tested for the presence of antigens into contact with a device having a matrix including a first zone containing (a) bound and immobilized antigens and (b) enzyme-linked antibodies which are capable of immunologically reacting with said antigens, said antibodies being positioned in said first zone such that they will be removed from said first zone but not removed from said first zone in the absence of such antigens, and a second zone removed from said first zone containing material capable of reacting with said enzyme-linked antibodies to produce a color forming reaction which indicates the presence of said antibodies;



allowing said fluid to permeate said device; and

observing the presence or absence of any color change in said second zone to thereby determine the presence or absence of the tested for antigen in said fluid.

4,446,233

HOMOGENEOUS IMMUNOASSAY USING COVALENT HYBRID ANTIBODIES

Karen Auditore-Hargreaves, and Frederick M. Miesowicz, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 5, 1982, Ser. No. 374,970

Int. Cl.[3] **G01N** *33/54, 33/58*

U.S. Cl. 435—7 **4 Claims**

1. A homogeneous immunoassay for the measurement of analyte comprising the steps of incubating sequentially or simultaneously:

(A) a substantially pure covalent hybrid antibody consisting essentially of two different heavy chain-light chain half-molecules, wherein the first of said half-molecules provides a binding site for a first antigen and the second of said half-molecules provides a chemically different binding site for the first or a second antigen; wherein said half-molecules are bonded to each other through disulfide linkage;

(B) a biological sample containing analyte;

(C) an indicator capable of being bound by said hybrid antibody; and

(D) reagents for signal-generating reaction.

4,446,234

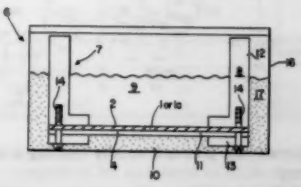
VITRO CELLULAR INTERACTION WITH AMNION MEMBRANE SUBSTRATE

Raimondo Russo, and Lance A. Liotta, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,477

Int. Cl.[3] **C12Q** *1/29;* **C12N** *5/00;* **C12M** *3/00*

U.S. Cl. 435—29 **16 Claims**



1. In an in vitro assay method for evaluating cellular interac-

tion with natural barrier tissue of the type wherein living cells are interacted in vitro with a substrate tissue, the improvement comprising employing a mammalian amnion membrane as the substrate tissue.

4,446,235

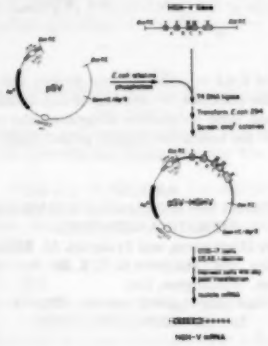
METHOD FOR CLONING HUMAN GROWTH HORMONE VARIENT GENES

Peter H. Seeburg, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Filed Mar. 22, 1982, Ser. No. 360,517

Int. Cl.³ C12P *19/34, 21/00, 21/02;* **C12N** *15/00*

U.S. Cl. 435—91 **3 Claims**



1. A method of obtaining cDNA encoding a desired polypeptide which comprises the steps of:

a. probing cloned genomic DNA to obtain genomic sections containing gene for said polypeptide,

b. incorporating the genomic sections of step a. into host cells and incubating said host cells under conditions suitable for transcription and processing of the transcript into corresponding mRNA by said host cells,

c. creating a cDNA bank containing cDNA encoding said polypeptide from the mRNA of step b., and

d. isolating the cDNA for said polypeptide from the cDNA bank of step c. by probing for the requisite DNA sequence of said polypeptide.

4,446,236

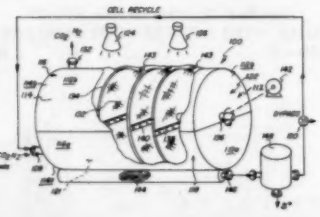
APPARATUS FOR A PHOTOCHEMICAL REACTION

Robert A. Clyde, P.O. box 983, Asheville, N.C. 28802

Filed Aug. 11, 1982, Ser. No. 407,299

Int. Cl.³ C12M *1/00;* **B01D** *33/34;* **C10J** *1/18;* **B01J** *16/00*

U.S. Cl. 435—287 **8 Claims**



1. Apparatus for photochemically reacting a selected fluid comprising:

(a) a hollow container, said container comprising a first lower section containing a volume of the selected fluid and a second upper section having at least one light transmitting wall;

(b) a shaft supported for rotation in said container;

(c) a plurality of porous support disks mounted on said shaft so that a first portion of each support disk extends into said lower container section and a second portion of each support disk extends into said upper container section;

(d) webbing means attached to each of said support disks, said webbing means comprising a multiplicity of high surface area fibers suitable for attaching said fluid and having a diameter of about ¼ inch or less;

(e) a light source located adjacent said light transmitting wall, said light source emitting radiation of a selected wave length for exciting selected molecules of said fluid; and

(f) means for rotating said shaft so that portions of said webbing means are sequentially immersed in the volume of fluid contained in said lower container section and then moved out of said fluid volume and into said upper container section whereat said fluid is exposed to radiation from said light source.

4,446,237

METHOD FOR DETECTION OF A SUSPECT VIRAL DEOXYRIBONUCLEIC ACID IN AN ACELLULAR BIOLOGICAL FLUID

Mark S. Berninger, Gaithersburg, Md., assignor to Life Technologies, Inc., Chagrin Falls, Ohio

Filed Mar. 27, 1981, Ser. No. 248,048

Int. Cl.³ G01N *33/58, 33/60;* **C12N** *15/00*

U.S. Cl. 436—504 **20 Claims**

1. A method for evaluating an acellular biological fluid as drawn from a subject for the presence of a suspect viral DNA thereby obviating in vivo or tissue culture techniques, consisting essentially of:

(a) treating said acellular biological fluid to immobilize on a solid substrate in denatured form said suspect viral DNA present in said acellular biological fluid;

(b) contacting said solid substrate with a radioisotopically-labeled suspect viral denatured DNA probe to renature said immobilized suspect viral DNA present on said substrate to form a radioisotopically-labeled renatured DNA; and

(c) evaluating the product of step (b) for the presence of said radioisotopically-labeled renatured DNA.

4,446,238

BRIGHT FIELD LIGHT MICROSCOPIC METHOD OF LOCALIZING TISSUE ANTIGENS

Jan R. De Mey, Turnhout, and Marc K. J. J. Moeremans, Mol, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Jan. 25, 1982, Ser. No. 342,552

Claims priority, application United Kingdom, Mar. 19, 1981, 8108606

Int. Cl.³ G01N *33/54, 33/74*

U.S. Cl. 436—527 **2 Claims**

1. A two step indirect bright field light microscopic method for the detection of antigens in tissue sections, which method comprises the steps of

(i) preparing the tissue sections;

(ii) reacting the tissue sections with primary antibodies specific to said antigens;

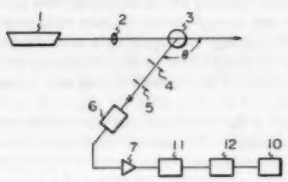
(iii) detecting the specific binding sites, where the primary antibodies are attached, with colloidal gold granules coated with secondary antibodies specific to said primary antibodies; and

(iv) mounting the sections.

4,446,239
LIGHT SCATTERING IMMUNOASSAY INVOLVING PARTICLES WITH SELECTIVE FREQUENCY BAND APPARATUS

Yasuhiro Tsuji, and Kiyoshige Wakabayashi, both of Saitama, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,610
Claims priority, application Japan, Apr. 24, 1981, 56-62237
Int. Cl.[3] G01N *33/54, 21/49*
U.S. Cl. 436—532 11 Claims



1. A method of measuring an antigen-antibody reaction comprising the steps of:

preparing a suspension of insoluble microscopic carrier particles which carry at least an antigen, an antibody or a hapten;

forming an agglutination promoting or agglutination inhibiting reaction system among said carrier particles based on an antigen-antibody reaction, using said suspension and one or more antigen, antibody or hapten;

irradiating said agglutination promoting or agglutination inhibiting reaction system with light having a limited frequency bandwidth;

detecting light scattered at one or more specific angles from said reaction system;

selecting signals representative of one or more specific frequency bands from a spectrum signal representative of said scattered light, said specific frequency bands comprising limited frequency portions of the entire bandwidth of said spectrum signal; and

analyzing the antigen, antibody or hapten in a specimen of interest based on one or more of said selected signals.

6. An apparatus for measuring an antigen-antibody reaction to determine the quantity of antigen, antibody or hapten in a specimen, which apparatus comprises:

a light scattering cell for receiving a suspension of insoluble microscopic carrier particles which carry at least an antigen, an antibody or a hapten, and a specimen solution which includes at least an antigen, an antibody or a hapten for inducing an antigen-antibody reaction with said suspension;

optical means for irradiating said scattering cell with light having a limited frequency bandwidth;

photodetection means for receiving light, scattered from said cell, at one or more scatter angles and for generating an electrical output signal in response to said light;

selection means for generating scatter spectrum intensity signals representative of one or more specific frequency bands of the electrical output signals of said photodetection means, said specific frequency bands comprising limited frequency portions of the entire bandwidth of said electrical output signals; and

indicating means for providing an indication of said scatter spectrum intensity signals.

4,446,240
PANCREAS SPECIFIC PROTEIN SYSTEMS

Samuel T. Nerenberg, 17931 Wellbank La., Huntington Beach, Calif. 92649

Filed Jan. 30, 1981, Ser. No. 230,298
Int. Cl.[3] G01N *33/56, 33/60*
U.S. Cl. 436—542 18 Claims

1. Substantially immunologically pure Pan Ag, an isotonic saline soluble pancreatic acinar cell cytoplasmic glycoprotein having a molecular weight of about 2.25×10^5 daltons, a carbohydrate content of about 18 percent by weight, an antigenic stability in the range of from about pH 2.8 to about 8.5, an antigenic stability to incubation with deoxyribonuclease and ribonuclease, an antigenic instability to incubation with trypsin and neuraminidase and which precipitates at between about 245 and about 340 grams per liter of ammonium sulfate saturation.

12. A method for detecting the presence of Pan Ag in a biological sample, comprising the steps of contacting the sample with a labelled complex of a Pan Ag as claimed in claim 1 and a monospecific antibody for said Pan Ag, and measuring the amount of labelled Pan Ag released by contact with said sample.

4,446,241
LEAD-FREE AND CADMIUM-FREE GLASS FRIT COMPOSITIONS FOR GLAZING, ENAMELING AND DECORATING

Josef Francel, Toledo; Daniel R. Stewart, Maumee, and Uriah Horn, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 28, 1982, Ser. No. 392,974
Int. Cl.[3] C03C *1/00*
U.S. Cl. 501—14 14 Claims

1. A lead-free, cadmium-free and zinc-free glass frit composition having a fiber softening point of about 535° C. to about 609° C. consisting essentially of the following components present in the indicated approximate weight percent ranges based on the total composition:

Component	Weight Percent
Al_2O_3	0–30
B_2O_3	16–32
SiO_2	11–40
Li_2O	4–12
ZrO_2	0–18
SnO_2	0–20
CeO_2	0–2
La_2O_3	0–15
CaO	0–16
SrO	0–13
BaO	0–7
Na_2O	0–3.5
F	0–2.6

and wherein

$\Sigma\ SnO_2 + CaO$	is	2–23
$\Sigma\ ZrO_2 + La_2O_3$	is	2–33
$\Sigma\ ZrO_2 + Al_2O_3$	is	0–26.5
$\Sigma\ CaO + SrO + BaO$	is	0–19.25

12. A colored enamel for decorating glass, glass-ceramic and ceramic ware comprising frit as defined in claim 1 and from 4% to 15% of a low expansion filler or pigment, based on the weight of the glass frit.

4,446,242

SYNTHESIS OF REFRACTORY MATERIALS

Joseph B. Holt, San Jose, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 28, 1983, Ser. No. 470,115
Int. Cl.[3] C04B 35/58
U.S. Cl. 501—96 20 Claims

1. A method of synthesizing refractory nitride compositions, comprising:

(a) mixing a metal azide with at least a stoichiometric amount of a transition metal of the IIIB, IVB groups, a rare earth metal or a mixture thereof;

(b) igniting the resulting mixture of step (a); and

(c) forming a refractory nitride composition.

4,446,243

CATALYSTS FOR OLEFIN POLYMERIZATION COMPRISING THE REACTION PRODUCT OF ORGANOTITANIUM AND ORGANOCHROMIUM WITH ZEOLITES

Arthur W. Chester, Cherry Hill, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 315,827, Oct. 27, 1981, Pat. No. 4,376,722. This application Dec. 20, 1982, Ser. No. 450,934
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.[3] C08F 4/76, 4/78
U.S. Cl. 502—62 10 Claims

1. A catalyst composition especially suitable for promoting polymerization of 1-olefins, said composition comprising the reaction product of

(A) a crystalline aluminosilicate zeolite having a silica to alumina molar ratio of at least about 12 and a Constraint Index within the approximate range of about 1 to 12; and

(B) an organometallic compound of the formula:

$$MY_nX_{m-n}$$

wherein

M is a metal selected from titanium and chromium;

Y is alkyl;

X is halogen;

n is 1–4; and

m is greater than or equal to n and is 3 or 4.

4,446,244

HYDROCARBONS HYDROPROCESSING WITH IMOGOLITE CATALYST

Robert A. Van Nordstrand, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 78,867, Sep. 26, 1979, Pat. No. 4,394,253. This application Apr. 22, 1983, Ser. No. 487,547
Int. Cl.[3] B01J 21/16
U.S. Cl. 502—84 7 Claims

1. A catalyst composition comprising shaped catalytic bodies including

(1) rods of dispersed fibrous form imogolite;

(2) at least one inorganic oxide gel, said gel bonding said rods together in substantially random mutual orientation in said catalytic bodies.

6. A catalyst composition according to claim 1 wherein said catalytic bodies further include from about 0.1 to about 10 weight percent of at least one metal selected from chromium, molybdenum, tungsten and vanadium.

7. A catalyst composition according to claim 1 wherein said catalytic bodies further include from about 0.1 to about 10 weight percent of at least one metal selected from iron, nickel and cobalt.

4,446,245

RECOATING OF ELECTRODES

Jean M. Hinden, Chambesy, Switzerland, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Mar. 8, 1982, Ser. No. 356,168
Claims priority, application United Kingdom, Apr. 6, 1981, 8110711
Int. Cl.[3] C25B 11/10, 11/08; B05D 5/12; B44D 1/18
U.S. Cl. 502—101 10 Claims

1. A method of recoating previously-used dimensionally stable electrodes having a valve metal base and an originally conductive and electrocatalytic coating containing at least one oxide of a platinum-group metal and at least one oxide of a valve metal optionally with at least one other metal oxide, which comprises cleaning the electrode surface by removing loose material and foreign matter without removing adhering portions of the coating, and applying a new electrocatalytic coating similar in composition to the old coating over the old coating in a number of layers with drying and baking of each layer, characterized by activating the electrode surface after the cleaning and before application of the new electrocatalytic coating by applying to the cleaned electrode surface one or more coats of an essentially valve-metal free solution containing at least one decomposable compound of a platinum-group metal not present in said old or new coatings, allowing each coat of said solution to impregnate the old coating, drying and baking each applied coat to enrich the old coating with platinum group metal and/or oxide, said solution also containing an agent which attacks valve metal oxide in the old coating and converts it into ions of the valve metal which mix with compound(s) of platinum group metal and form compound(s) of valve metal and platinum-group metal and/or oxide during the baking step.

4. The method of claim 1 wherein said solution also contains at least one decomposable compound of a non-valve metal, the amount of such non-valve metal compound(s) being less than the amount of platinum-group metal compound(s) therein.

5. The method of claim 4, wherein the activating solution contains at least one decomposition compound of cobalt, manganese, tin, bismuth, antimony, lead, iron or nickel.

4,446,246

CATALYST SYSTEMS FOR TWO-PACK ACRYLIC ADHESIVE FORMULATIONS

Vincent D. McGinniss, Delaware, Ohio, assignor to Three Bond Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,270
Int. Cl.[3] C08F 4/30, 4/32
U.S. Cl. 502—155 8 Claims

1. A catalyst system capable of effecting room temperature cure of a curable mixture comprising at least one ethylenically-unsaturated compound which comprises a Cu^{+1} activator and a peroxide initiator.

4,446,247

COMPOSITIONS AND PROCESS

Anthony F. Jacobine, Meriden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 290,689, Aug. 6, 1981. This application Oct. 11, 1983, Ser. No. 540,224
Int. Cl.[3] B01J 31/02
U.S. Cl. 502—167 6 Claims

1. A liquid photoinitiator composition which comprises from about 20 to about 80 percent by weight of benzophenone the remainder of said composition being a tetra(lower-alkyl)urea.

4,446,248

HYDROTREATING CATALYST

Howard D. Simpson, Irvine; Ryden L. Richardson, Whittier, and Paul K. Angmorter, Pomona, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 16, 1982, Ser. No. 408,264
Int. Cl.³ B01J 27/14
U.S. Cl. 502—211 24 Claims

1. A catalyst composition useful for denitrogenation and desulfurization of hydrocarbon feedstocks by reaction with hydrogen, said catalyst composition comprising molybdenum, nickel and phosphorous active components on support particles comprising gamma alumina, said catalyst having been prepared by a method comprising the steps of:

(a) contacting said support particles with an aqueous ammonia solution;

(b) subsequently impregnating the resultant support particles with molybdenum, nickel and phosphorous by contacting said support particles with an acidic impregnating solution; and

(c) calcining impregnated particles from step (b) at an elevated temperature in the presence of oxygen.

4,446,249

COPPER CATALYST COMPOSITIONS FOR FLUID-BED OXYHYDROCHLORINATION OF ETHYLENE

Jamal S. Eden, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 274,995, Jun. 18, 1981, abandoned, which is a continuation of Ser. No. 91,288, Nov. 5, 1979, abandoned. This application May 17, 1982, Ser. No. 378,928
Int. Cl.³ B01J 27/10; C07C 17/156
U.S. Cl. 502—225 12 Claims

1. A catalyst composition consisting essentially of 2% to 12% by weight of copper, as cupric chloride, on a fluidizable gamma alumina support having a surface area of about 60 to about 200 m^2g, wherein said support is modified prior to the deposit of copper by incorporating in it from 0.5% to 3.0% by weight based on the weight of the support of at least one added metal selected from the group consisting of potassium, lithium, rubidium, cesium, alkaline earth metals, rare earth metals and combinations thereof, by admixing a water soluble salt of the metal(s) with the gamma alumina support, drying the mix, and calcining the mix at 350° C. to 600° C. for about 4 to about 16 hours and before the copper is deposited.

9. The catalyst composition of claim 1 wherein the metals incorporated in the gamma alumina support are potassium and barium.

12. The catalyst composition of claim 1 wherein the metals incorporated in the gamma alumina support are barium and lanthanum.

4,446,250

PLATE CATALYST BODY FOR DENITRATION

Senji Niwa, Kakogawa; Takuji Sasaki, Hyogo; Masaaki Shinto, Akashi, and Noriaki Imamura, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 14, 1982, Ser. No. 368,319
Claims priority, application Japan, Apr. 20, 1981, 56-59952
Int. Cl.³ B01J 21/06, 23/86, 35/02
U.S. Cl. 502—309 6 Claims

1. A foamed metallic plate catalyst body for denitration having pores with average pore diameters of about 0.1 mm to about 10 mm and a thickness of about 0.5 mm to about 20 mm and including a mixture of TiO_2 carrier and a catalytic substance supported by the foamed metallic plate body.

4,446,251

PROCESS FOR PRODUCING TWO-CARBON ATOM OXYGENATED COMPOUNDS FROM SYNTHESIS GAS WITH MINIMAL PRODUCTION OF METHANE

William J. Bartley, and Thomas P. Wilson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 121,985, Feb. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,869, Jun. 28, 1979, abandoned. This application Mar. 17, 1982, Ser. No. 358,897
Int. Cl.³ C07C 27/06
U.S. Cl. 518—716 5 Claims

1. In a process for the reaction of a synthesis gas containing carbon monoxide and hydrogen in the presence of a hydrogenation catalyst, the improvement for selectively producing two-carbon atom oxygenated hydrocarbon products while minimizing the production of methane which comprises continuously contacting said synthesis gas with a heterogeneous catalyst consisting of rhodium and sodium on a silica gel support at reaction conditions such that product efficiencies based on carbon consumption in excess of 10 percent are achieved and ethanol, acetic acid and acetaldehyde are formed in an amount which is at least about 50 weight percent of the two or more carbon atom compounds produced by the reaction, the concentration of sodium in said catalyst being at least 0.1 weight percent whereby the production of methane is reduced such that the carbon efficiency to methane is lower than the corresponding carbon efficiency when sodium is absent from said heterogeneous catalyst, which reaction conditions include a temperature within the range of from about 150°–450° C., a pressure within the range of from about 15–10,000 psig, and a mole ratio of hydrogen to carbon monoxide within the range of from about 20:1 to 1:200.

4,446,252

CHROMIUM OXIDE IN ION EXCHANGE RESIN

Alvin F. Beale, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 248,656, Mar. 27, 1981, Pat. No. 4,366,261. This application Jul. 30, 1982, Ser. No. 403,887
Int. Cl.³ B01J 41/14
U.S. Cl. 521—28 6 Claims

1. A process for incorporating $Cr_2O_3.nH_2O$ into a porous resin, said process comprising

contacting the resin with an aqueous solution of water-soluble chromium III compound,

adding thereto a transient alkaline material to precipitate $Cr_2O_3.nH_2O$ in-situ in the pores of the resin, and

removing any excess soluble chromium compounds, alkaline material, and by-products from the resin.

4,446,253

PRODUCTION OF FINE-CELLED FOAMS FROM STYRENE POLYMERS

Klaus Hahn, Kirchheim; Heinz Weber, Gruenstadt; Wolfgang Guenther, Ludwigshafen; Bernhard Schillinger, Mannheim, and Reinhold Weber, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,347
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131446
Int. Cl.³ C08J 9/00
U.S. Cl. 521—79 4 Claims

1. A process for the production of a foam by melting a styrene polymer, mixing the melt with a volatile blowing agent and a nucleating agent under superatmospheric pressure, letting the mixture down to atmospheric pressure, and cooling the foam, wherein from 0.02 to 2% by weight of the calcium salt of a long chain fatty acid, and from 0.01 to 1% by weight of a finely divided, inorganic substance having a mean pratical

size of from 0.01 to 200 μm and selected from the group consisting of magnesium oxide, zinc oxide, aluminum oxide, talc, silica or chalk, said inorganic substance being insoluble in the styrene polymer, are employed as the nucleating agent, the percentages being based on the styrene polymer.

4,446,254

CROSSLINKED POLYOLEFIN FOAM CONTAINING A HIGH CONCENTRATION OF AN INORGANIC MATERIAL AND PROCESS FOR PRODUCING THE SAME

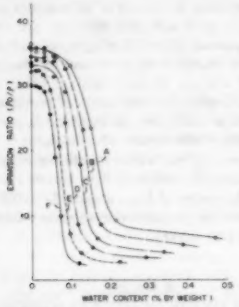
Hiroyuki Nakae, Kawasaki; Isamu Noguchi, Tokyo, and Masayuki Kondo, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 222,153, Jan. 2, 1981, abandoned. This application Apr. 9, 1982, Ser. No. 367,045

Claims priority, application Japan, Feb. 21, 1980, 55-20763; Oct. 29, 1980, 55-151904

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—92 **23 Claims**



1. A crosslinked foam having an expansion ratio of 25 to 60 comprising a composition containing 100 parts by weight of a resin component consisting of a non-crystalline ethylene-vinyl acetate copolymer having a vinyl acetate content in the range of 40 to 90% by weight or a mixture thereof with an amount not more than 80% by weight of a thermoplastic resin, and 50 to 500 parts by weight of an inorganic powder material which is at least one powder selected from the group consisting of aluminum hydroxide powder and magnesium hydroxide powder.

4,446,255

SIZED CARBON FIBERS SUITABLE FOR USE IN COMPOSITES OF IMPROVED IMPACT RESISTANCE

Lincoln Ying, Bridgewater, and Thomas P. Carter, Jr., Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,326

Int. Cl.³ B32B *9/00*; **B05D** *3/02*; **C08K** *3/04*

U.S. Cl. 523—205 **12 Claims**

1. A carbon fiber having a coating on the surface thereof in a concentration of approximately 0.5 to 3.0 percent by weight based on the weight of the carbon fiber of a sizing composition which comprises as a first component an epoxy resin comprising the reaction product of epichlorohydrin and p-amino phenol and a second component consisting of an acrylonitrile butadiene-styrene graft copolymer.

6. A composite structure comprising a rigid polymeric matrix having carbon fibers incorporated therein which are coated on the surface thereof with approximately 0.5 to 3.0 percent by weight based on the weight of the carbon fibers of a sizing composition which comprises as a first component an epoxy resin comprising the reaction product of epichlorohydrin and p-amino phenol and a second component consisting of an acrylonitrile butadiene-styrene graft copolymer.

4,446,256

EPOXIDE RESIN AQUEOUS DISPERSANT COMPRISING THE REACTION PRODUCT OF DIISOCYANATE, DIOL AND POLYETHER GLYCOL MONOETHER

Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 403,897, Jul. 30, 1982, abandoned. This application May 12, 1983, Ser. No. 493,857

Int. Cl.³ C08G *18/30, 18/40, 18/58*

U.S. Cl. 523—402 **9 Claims**

1. An epoxide resin aqueous dispersant comprising the reaction product of about n+1 moles of a diisocyanate, n moles of an aromatic, aromatic-based or cycloaliphatic diol, and 2 moles of a long-chain, aliphatic polyether glycol monoether, wherein n is 1–10, and wherein the long-chain, aliphatic polyether glycol monoether is derived from an aliphatic polyether glycol having a molecular weight of about 1000 to about 14,000.

4,446,257

AQUEOUS COATING POWDER SUSPENSIONS AND THEIR PREPARATION

Petrus G. Kooijmans, and Wolfgang Kunze, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 241,152, Mar. 6, 1981, abandoned. This application May 27, 1982, Ser. No. 382,534

Claims priority, application United Kingdom, May 22, 1980, 8016917

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—403 **9 Claims**

1. An aqueous coating powder suspension containing no surfactant and no addition of acid wherein the powder particles comprise an intimate mixture of binder components comprising:

(a) an epoxy resin/amine adduct which is essentially insoluble in water and having terminal amino groups and a plurality of alcoholic hydroxyl groups,

(b) a cross-linking component, and, optionally,

(c) a solid polyepoxide, said mixture having a softening point of at least 70° C. and a particle size in the suspension being essentially below 20 micrometers.

4,446,258

AQUEOUS COATING COMPRISING DISPERSIBLE EPOXY RESIN-ACID POLYMER ESTER AND DILUENT POLYMER, AND METHOD OF PREPARATION

Shaw C. Chu, Belle Mead, and Arthur T. Spencer, New Providence, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,818

Int. Cl.³ C09D *3/58*

U.S. Cl. 523—406 **33 Claims**

1. An aqueous dispersion comprising

A. an ionic polymer component containing sufficient carboxyl groups to render it self dispersible in water in neutralized form which is the reaction product of an epoxy resin containing 1,2-epoxy groups, and a preformed addition polymer containing carboxyl groups, said ionic polymer containing hydroxy ester groups from the reaction of 1,2-epoxy groups on said epoxy resin with carboxyl groups on said preformed addition polymer, and being substantially free of unreacted 1,2-epoxy groups;

B. an addition polymer different from said preformed addition polymer defined in (A) and;

C. ammonia or an organic amine neutralizing agent in an amount sufficient to render the composition stably dispersible in water.

4,446,259

COATING COMPOSITION OF A BLEND OF A GLYCIDYL ACRYLIC POLYMER AND A REACTIVE POLYSILOXANE

Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,840
Int. Cl.³ C08L 27/10, 63/10, 83/06
U.S. Cl. 523—408 13 Claims

1. A coating composition comprising about 10–80% by weight of a film forming binder and 20–90% by weight of a liquid carrier selected from the group consisting of organic solvent for the binder, aqueous liquid or a blend of solvent and nonsolvent for the binder; wherein the binder consists essentially of a blend of about

a. 20–90% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of about 10–50% by weight, based on the weight of the acrylic polymer, of polymerized glycidyl methacrylate or glycidyl acrylate and 50–90% by weight of other polymerized ethylenically unsaturated monomers selected from the group consisting of alkyl methacrylate having 1–12 carbon atoms, alkyl acrylate having 1–12 carbon atoms, styrene, alkyl substituted styrenes and mixtures thereof and wherein the acrylic polymer has a weight average molecular weight of about 10,000–100,000, a number average molecular weight of about 2,000–20,000 and a molecular weight distribution of about 2–5 and a glass transition temperature of about 20°–50° C.;

b. 10–80% by weight, based on the weight of the binder, of a crosslinkable polysiloxane having the following units:

where R and R^1 are individually selected from the group consisting of alkyl group having 1–6 carbon atoms, hydroxyl group and phenyl group and contains sufficient hydroxyl groups to provide a silanol content of about 0.5–7% by weight.

4,446,260

WATER DILUTABLE EPOXY COATING COMPOSITION

Richard A. Woods, Charlton, and Rajesh R. Mehta, Forest Gate, both of England, assignors to International Paint Public Limited Company, London, England

Filed Jun. 29, 1982, Ser. No. 393,512
Claims priority, application United Kingdom, Jul. 24, 1981, 8122992; Oct. 16, 1981, 8131231
Int. Cl.³ C08G 59/50, 59/68, 59/02
U.S. Cl. 523—409 10 Claims

1. A process for preparing a water dispersible coating composition comprising:

(A) reacting together at elevated temperature (a) 40–90 percent by weight of an epoxy resin composition of average epoxy functionality 1.0 to 2.0 epoxide groups per molecule and average molecular weight 2000 to 12,000 and (b) 10–60 percent by weight of a polymer containing carboxylic acid groups which is an addition copolymer of 10–85 percent by weight of an olefinically unsaturated carboxylic acid and 90–15 percent by weight of at least one olefinically unsaturated comonomer, the ratio of carboxylic acid groups in (b) to epoxide groups in (a) being from 1.5:1 to 20:1, and

(B) carrying out said reaction in the presence of 0.5 to 3.0 percent by weight of an amine in a mixture of a water miscible organic solvent with 5 to 30 percent by weight of water, the percentages of amine and of water being based on the combined weight of epoxy resin (a) and copolymer (b).

4,446,261

PROCESS FOR PREPARATION OF HIGH WATER-ABSORBENT POLYMER BEADS

Harumasa Yamasaki, and Shoichiro Harada, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,496
Claims priority, application Japan, Mar. 25, 1981, 56-43488
Int. Cl.³ C08L 5/00; B01J 31/06
U.S. Cl. 524—40 2 Claims

1. A process for preparing beads consisting of water-insoluble, crosslinked polymer, which beads have a particle size of from 100 to 1000 microns and have an absorbent capacity for physiological saline in the range of from 30 to 150 grams per one gram of the dried polymer, which consists of the steps of: dispersing droplets of (1) an aqueous solution consisting of water-soluble, ethylenically unsaturated monomer, from 0.01 to 5% by weight, based on the weight of said monomer, of water-soluble crosslinking agent, a water-soluble radical polymerization initiator, and the balance is water, said aqueous solution containing from 30 wt.% up to the saturation concentration of said monomer, into (2) a liquid dispersion medium having a temperature of higher than 40° C., said liquid dispersion medium consisting of an oil material selected from the group consisting of hydrocarbons having from 6 to 10 carbon atoms and halogenated aromatic hydrocarbons, and said oil material having dissolved therein from 0.05 to 10% by weight, based on the weight of said oil material, of a protective colloid selected from the group consisting of cellulose esters and cellulose ethers which are not soluble in said oil material at room temperature but are soluble in said oil material at a temperature of higher than 40° C., whereby to form a W/O suspension of said droplets in said liquid dispersion medium, the volumetric ratio of said dispersion medium/said aqueous solution being in the range of 1:1 to 5:1; suspension polymerizing said monomer, at a temperature higher than 40° C. in the presence of said crosslinking agent and said radical polymerization initiator, whereby to form said beads; and then recovering said beads from said liquid dispersion medium.

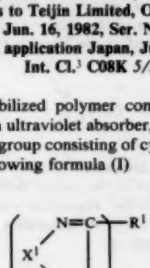
4,446,262

PROTECTION FROM ULTRAVIOLET LIGHT BY USE OF NOVEL ULTRAVIOLET ABSORBER

Nobuya Okumura, Ehime; Tetsuo Ichihashi, Matsuyama; Shunichi Matsumura, and Hiroo Inata, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 16, 1982, Ser. No. 389,117
Claims priority, application Japan, Jun. 19, 1981, 56-93722
Int. Cl.³ C08K 5/35
U.S. Cl. 524—89 28 Claims

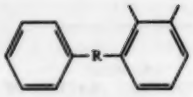
1. A photo-stabilized polymer composition comprising a polymer and as an ultraviolet absorber, at least one compound selected from the group consisting of cyclic imino esters represented by the following formula (I)



(I)

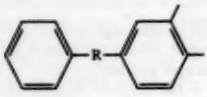
wherein X^1 represents 1,2-phenylene, 1,2-naphthylene, 2,3-naphthylene, a group represented by the formula (a)

(a)



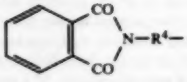
wherein R is —O—, —CO—, —S—, $-SO_2-$, $-CH_2-$, $-(CH_2)_2$ or $-C(CH_3)_2-$,
or a group represented by the formula (b)

(b)



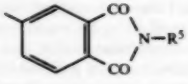
wherein R is as defined above,
n is 1, 2 or 3,
R^1 represents a hydrocarbon residue having a valence of n, or
when n is 1, R^1 further represents a residue selected from the group consisting of a group represented by the formula (c)

(c)



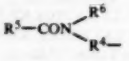
wherein R^4 represents an alkylene of 2 to 10 carbon atoms, phenylene or naphthylene,
a group of the formula (d)

(d)



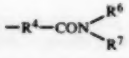
wherein R^5 represents an alkyl having 1 to 10 carbon atoms, a phenyl or a naphthyl,
a group of the formula (e)

(e)



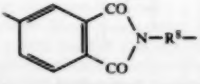
wherein R^4 and R^5 are as defined above, and R^6 is hydrogen atom or any one of the groups defined for R^5,
and a group represented by the formula (f)

(f)



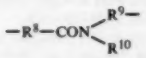
wherein R^4 and R^6 are as defined above, and R^7 is hydrogen atom or any one of the groups defined for R^5,
and when n is 2, R^1 further represents a direct bond, a residue selected from the group consisting of a group represented by the formula (g)

(g)



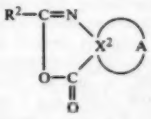
wherein R^8 is any one of the groups defined for R^4,
and a group represented by the formula (h)

(h)



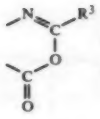
wherein R^8 is as defined above, R^9 is any one of the groups defined for R^4, and R^{10} is any one of the groups defined for R^6,
wherein each of the above groups defined for X^1 and R^1 may be substituted by a substituent selected from the group consisting of alkyl groups having 1 to 10 carbon atoms, aryl groups having 6 to 12 carbon atoms, cycloalkyl groups having 5 to 12 carbon atoms, aralkyl groups having 8 to 20 carbon atoms, alkoxy groups having 1 to 10 carbon atoms, carboacyl groups having 2 to 10 carbon atoms, halogen atoms and nitro groups,
and cyclic imino esters represented by the following formula (II)

(II)



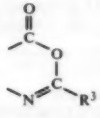
wherein A represents a group of the following formula (II)-a

(II)-a

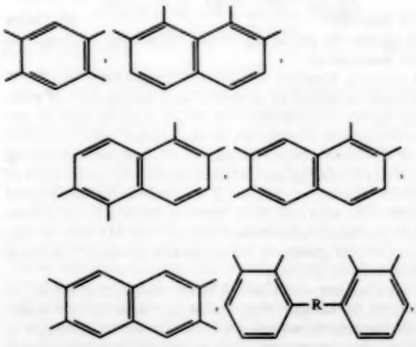


or a group of the following formula (II)-b

(II)-b



wherein R^2 and R^3 are identical or different and each represents a monovalent hydrocarbon residue; and
X^2 represents a tetravalent aromatic residue selected from the groups represented by the formulae:



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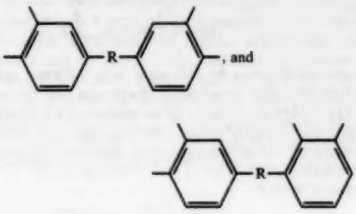


wherein R is as defined above,
in the unreacted state.

4,446,263
UV-STABILIZATION OF OXYMETHYLENE COPOLYMERS

Walter R. Bryant, Bishop, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 28, 1982, Ser. No. 453,997
Int. Cl.[3] **C08K** *5/34, 5/48, 5/13*
U.S. Cl. 524—100 **7 Claims**

1. A molding composition which exhibits desirable weathering stability comprising, based on the total composition:

(a) an oxymethylene copolymer having a melting point of at least about 150° C. and having at least one chain containing from about 85 to 99.6 mole percent of oxymethylene units interspersed with about 0.4 to 15 mole percent of oxyethylene units;

(b) about 0.1 to 1.0 percent by weight of 1,6-hexamethylene bis-(3,5-di-tert-butyl)-4 hydroxy hydrocinnamate,

(c) about 0.015 to 0.4 percent by weight of 2,4,6-triamino-sym-triazine;

(d) about 0.1 to 0.75 percent by weight of bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ((3,5-bis(1,1-dimethylethyl-4-hydroxyphenol)methyl)) butyl propanedioate; and

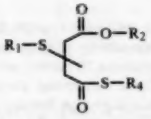
(e) about 0.25 to 1.0 percent by weight of 2-hydroxy-4-n-octoxy-benzophenone.

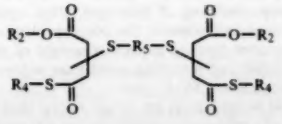
4,446,264
SYNERGISTIC ANTIOXIDANT MIXTURES

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 15, 1982, Ser. No. 368,604
Int. Cl.[3] **C07C** *153/07, 153/09*; **C08K** *5/37*
U.S. Cl. 524—109 **16 Claims**

1. A composition of matter which comprises an organic material prepared by reacting maleic anhydride, maleic acid or their esters with thiols; said organic material being defined by one of the following structural formulae:





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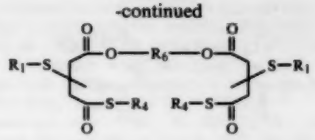
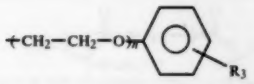
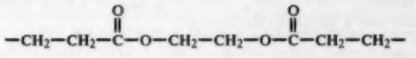


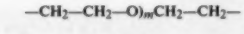
wherein R_1 is selected from the group comprising alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 10 carbon atoms, and phenyl; R_2 is hydrogen or a radical of the formula:



wherein n is a real number from 1 to 30 and R_3 is hydrogen or an alkyl radical of 1 to 12 carbon atoms; R_4 is an alkyl radical of 1 to 20 carbon atoms; R_5 is an alkylene radical of 2 to 10 carbon atoms or the radical of the formula:

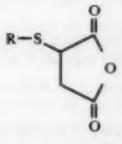


and R_6 is a radical selected from the group comprising alkylene of 2 to 10 carbon atoms and a radical of the formula:

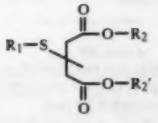


wherein n is 0 or a real number from 1 to 10.

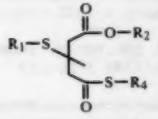
4. A stable organic composition which is prepared by mixing an organic material selected from the group consisting of natural and synthetic polymers and oils with at least one compound expressed by the general formulae I through VII:



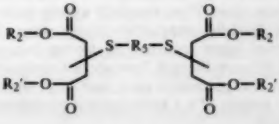
(I)



(II)



(III)



(IV)

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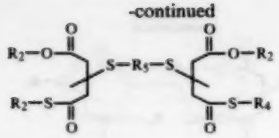
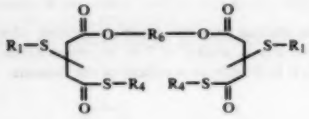
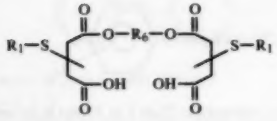


(V)



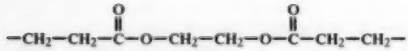
(VI)



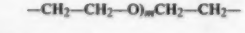
(VII)

wherein R is selected from the group comprising alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 10 carbon atoms, phenyl; and R_1 is selected from the group comprising alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 10 carbon atoms and phenyl; R'_2 is selected from the group comprising alkyl of 1 to 20 carbon atoms and a radical of the formula:

wherein n is a real number from 1 to 30 and R_3 is hydrogen or an alkyl radical of 1 to 12 carbon atoms; R_2 is selected from the group of R'_2 and hydrogen; and R_4 is an alkyl radical of 1 to 20 carbon atoms; and R_5 is an alkylene radical of 2 to 10 carbon atoms or the radical:



and R_6 is a radical selected from the group comprising alkylene of 2 to 10 carbon atoms and a radical of the formula:



wherein m is 0 or a real number from 1 to 10; together with at least one phenolic antioxidant.

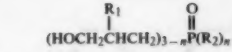
4,446,265

FLAME RETARDANT POLYPHENYLENE ETHER-STYRENE THERMOPLASTIC RESIN COMPOSITIONS

Diza P. Braksmayer, Cranbury, N.J., and Ronald F. Lovenguth, Doylestown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 1, 1982, Ser. No. 344,458
Int. Cl.³ C08K *5/52, 5/53*
U.S. Cl. 524—139 **14 Claims**

1. A polyphenylene ether-styrene resin composition containing from about 30 to about 40 weight percent of a polyphenylene ether and from about 70 to about 60 weight percent of a polystyrene, said polyphenylene ether-styrene resin composition being rendered flame retardant by having incorporated therewith about 100 parts thereof, from about 4 to about 7 parts by weight of a triaryl phosphate ester, and from about 0.5 to about 3 parts by weight of a 3-hydroxyalkyl phosphine oxide having the formula:



wherein R_1 may be the same or a different radical selected from the group consisting of hydrogen and the methyl radical, R_2 is a radical of 4 to 8 carbon atoms and n is either zero or one; and said polyphenylene ether-styrene resin having a UL-94 rating of V-1 or better, a heat distortion temperature greater than about 92° C. and a melt viscosity at 260° C. less than 200 pascal second.

4,446,266

N,N'-BIS-SALICYLOYL-HYDRAZINE AS A METAL DEACTIVATOR

Wolfgang von Gentzkow, Kleinsendelbach, and Roland Rubner, Röttenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,409
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2833870
Int. Cl.³ C08K *5/25*
U.S. Cl. 524—193 **3 Claims**

1. In a method for stabilizing organic materials in contact with or containing copper or copper ions by including therein a metal deactivator, the improvement comprising utilizing as said metal deactivator N,N'-bis-salicyloyl hydrazine prepared by the reaction of a salicylic-acid alkyl ester and a compound selected from the group consisting of hydrazine and salicylic-acid hydrazide.

4,446,267

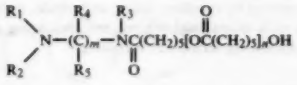
SULFONATED POLYMER AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 332,850, Dec. 21, 1981, Pat. No. 4,421,898. This application Sep. 29, 1982, Ser. No. 426,666
Int. Cl.³ C08K *5/09, 5/21;* **C08L** *51/08, 53/00*
U.S. Cl. 524—211 **5 Claims**

1. A blend composition which comprises a blend of:

(a) A sulfonated polymer derived from elastomeric or thermoplastic polymers selected from the group consisting of Butyl rubbers, EPDM polymers, polystyrene, poly-t-butylstyrene, polychlorostyrene, polyalpha methyl styrene and interpolymers of the aforementioned with acrylonitrile or vinyl toluene, which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonated group being neutralized with a polycaprolactone polymer having the formula:



wherein n is 1 to 500, m is 1 to 20; R_1 or R_2 are selected from the group consisting of alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms, and aryl groups; R_3 is selected from the group consisting of hydrogen, alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms and aryl groups; R_4 and R_5 are selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl groups and wherein the polycaprolactone polymer has a number average molecular weight of about 200 to about 50,000 and a melting point from below room temperature to about 55° C.; and

(b) At least about 3 parts by weight to less than 60 parts by weight of a preferential plasticizer per 100 parts by weight

of the sulfonated polymer, wherein the preferential plasticizer is selected from the group consisting of carboxylic acids having at least 8 carbon atoms, metallic salts of said carboxylic acids, urea, thioureas, amides, ammonium and amine salts of said carboxylic acids, amines, a combination of a carboxylic acid and a metallic salt of said carboxylic acid, wherein a metal ion of said metallic salt is selected from the group consisting of aluminum, antimony iron, lead and Groups I-A, II-A, I-B and II-B of the Periodic Table of Elements, and mixtures thereof.

4,446,268

COMPOSITIONS

Garland G. Lee, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 26, 1982, Ser. No. 402,209

Int. Cl.³ C08K *5/10;* **C08L** *69/00*

U.S. Cl. 524—315 **11 Claims**

1. A composition comprising a thermoplastic resin selected from the group consisting of aromatic carbonate, polysulfone, polyethersulfone, polyamide, polysulfide, polyurethane, polyvinylhalide, acrylonitrile butadiene styrene, butadiene styrene or methacrylate butadiene styrene in admixture with an injection mold releasing effective amount of an ester of the formula

$$R_1C(=O)-OR_2$$

wherein R_1 is alkyl of from one to about five carbon atoms, inclusive; and R_2 is alkyl of from about ten to about thirty carbon atoms, inclusive or monoalkenyl of from about ten to about thirty carbon atoms, inclusive, with the provisos that the unsaturation is not on the carbon attached to the oxygen and the ester is essentially non volatizable under processing conditions.

6. A composition in accordance with claim 1 wherein the thermoplastic resin is an aromatic carbonate polymer.

4,446,269

SOLVENTS OF CARBOXYL ESTER COMPOUNDS AND FLUOROPOLYMERS

Raimund H. Silva; Paul R. Resnick, both of Wilmington, Del., and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 176,595, Aug. 8, 1980, Pat. No. 4,348,310, which is a continuation-in-part of Ser. No. 079,173, Sep. 26, 1979, abandoned. This application Mar. 3, 1982, Ser. No. 354,194

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C08K *5/10*

U.S. Cl. 524—316 **8 Claims**

1. A solution of fluoropolymer in halogenated solvent wherein: the fluoropolymer is present in an amount greater than 0.5 percent, by weight, of the solution at 25° C.; the solvent is

$$CF_2XCFXO(CF_2CFO)_n(CF_2)_mCOOCH_3$$
$$\quad\quad\quad

(C) 0.5–20 weight parts of a non-crystalline ethylene-propylene copolymer.

4,446,273

AQUEOUS DISPERSIONS OF VINYLIDENE CHLORIDE RESINS

Kazuhiko Hiyoshi; Norio Matsuura; Michiharu Matsuguchi, all of Nobeoka; Norio Onofusa, and Tadao Nishikage, both of Yokohama, all of Japan, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 270,060, Jun. 3, 1981, abandoned. This application Sep. 8, 1982, Ser. No. 415,853

Int. Cl.³ C08L *31/00*

U.S. Cl. 524—556 **2 Claims**

1. An aqueous dispersion of a vinylidene chloride copolymer resin the copolymer resin consisting essentially of: (a) from about 83 to about 93 percent by weight, based on solid content of the aqueous dispersion, of vinylidene chloride; (b) from about 17 to about 7 percent by weight, based on the solid content of the aqueous dispersion, of one or more ethylenically unsaturated monomers copolymerizable therewith, the ethylenically unsaturated monomers being selected from the group consisting of methyl acrylate, ethyl acrylate, acrylonitrile, methyl methacrylate, ethyl methacrylate, and methacrylonitrile; and (c) from about 0.5×10^{-4} to about 4×10^{-4} mol of unsaturated carboxylic acid units in terms of the carboxyl group content per gram of solids in the aqueous dispersion, said unsaturated carboxylic acid having a partition coefficient of 1 or more in a vinylidene chloride-water system at 30° C. with the further limitation that out of said unsaturated carboxylic acid content the quantity of the unsaturated carboxylic acid existing in a form titratable with a 1/20 N aqueous solution of sodium hydroxide does not exceed either about 1.5×10^{-4} mol in terms of the carboxyl group content per gram of the solids in the aqueous dispersion or 60 percent of the total carboxyl group content in said aqueous dispersion, whichever is smaller.

4,446,274

VINYL ACETATE-ETHYLENE COPOLYMER EMULSION AND AQUEOUS EMULSION ADHESIVE COMPOSITION CONTAINING THE EMULSION

Haruo Okazaki, Ichihara, and Takashi Ohkubo, Chiba, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 277,451, Jun. 25, 1981, abandoned. This application Feb. 16, 1983, Ser. No. 467,057

Int. Cl.³ C08L *33/00*

U.S. Cl. 524—812 **7 Claims**

1. An emulsion of a quarterly vinyl acetate-ethylene copolymer emulsified in an aqueous medium, said quarterly copolymer consisting of

100 parts, by weight, of a vinyl acetate-ethylene copolymer prepared from 95 to 60 parts, by weight, of vinyl acetate monomer (I) and 5 to 40 parts, by weight, of ethylene monomer (II);

0.5 to 7 parts, by weight, of an acid monomer (III) selected from the group consisting of monobasic unsaturated carboxylic acids each having 3 to 17 carbon atoms, dibasic unsaturated carboxylic acids each having 3 to 17 carbon atoms, anhydrides of said dibasic unsaturated carboxylic acids and semi-esters of said dibasic unsaturated carboxylic acids each having an alkyl chain of the alcohol part having 1 to 10 carbon atoms, and mixtures thereof; and

0.5 to 15 parts, by weight, of a substantially water-insoluble acrylamide compound (IV) represented by the general formula of

CH_2=CHCONHCH$_2$OR; wherein R is an alkyl group having 4 to 10 carbon atoms.

4,446,275

SORBENT FOR SACCHARIDES, GLYCOPROTEINS AND POLYESTERS COMPRISING A LECTIN COVALENTLY BONDED WITH A VEHICLE AND METHOD FOR PREPARATION THEREOF

Karel Filka; Jiri Coupek, and Jan Kocourek, all of Prague, Czechoslovakia, assignors to Prirodovedecka fakulta University Karlovy, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 143,752, Apr. 25, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 369,232

Int. Cl.³ C12N *11/16, 11/12, 11/06*

U.S. Cl. 525—54.1 **1 Claim**

1. Sorbent for saccharides, glycoproteins and polymers comprising a lectin covalently bonded with a vehicle selected from the groups consisting of (a) oxidized glycosylated hydroxyethylacrylates, (b) oxidized glycosylated hydroxyalkyl methacrylates, and (c) oxidized glycosylated polyvinyl alcohol.

4,446,276

AGEING-RESISTANT, PROCESSING-STABLE, HIGH STRENGTH MIXTURES BASED ON THERMOPLASTIC POLYESTERS

Rudolf Binsack, Krefeld; Christian Lindner, Cologne; Dieter Rempel, and Karl-Heinz Ott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,788

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3117052

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—64 **10 Claims**

1. A mixture comprising:

(A) from 55 to 99% by weight, based on the total of components A and B, of at least one thermoplastic polyester based on aromatic dicarboxylic acids, and

(B) from 1 to 45% by weight, based on the total of components A and B, of a pulverulent graft polymer having an average particle size of 0.01 to 10 mm and comprising

(a) from 80 to 98% by weight, based on B, of an acrylate rubber having a glass transition temperature of below 0° C. as the graft base, and

(b) from 2 to 20% by weight, based on B, of units of at least one polymerisable ethylenically unsaturated monomer which does not form a stable emulsion, the homo- or copolymers of which, produced in the absence of (a), have a glass transition temperature of above 25° C., as graft monomers,

characterised in that the graft polymer B is obtainable by grafting monomer (b) on the completely broken latex of (a) suspended in water, in the absence of a suspending agent.

4,446,277

THERMOPLASTIC MOLDING MATERIAL

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Franz Haaf, Bad Durkheim; Juergen Hambrecht, Heidelberg, and Herbert Naarmann, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 338,104, Jan. 8, 1982, abandoned. This application May 23, 1983, Ser. No. 497,150

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102251

Int. Cl.³ C08L *61/04*

U.S. Cl. 525—68 **2 Claims**

1. A thermoplastic molding material based on a mixture of an impact-resistant styrene polymer and a polyphenylene ether, wherein the impact-resistant styrene polymer contains, as its soft component, a graft copolymer consisting essentially of styrene grafted to a copolymer of an alkyl acrylate, where the alkyl is of 4 to 8 carbon atoms, and 0.5 to 10% by weight, based on total monomers, of a copolymerizable polyfunctional mon-

omer containing at least two copolymerizable ethylenic double bonds which are not 1,3-conjugated, the soft component having a mean particle diameter of from 0.3 to 1.0 μm.

4,446,278

POLYPHENYLENE OXIDE BLENDS

George R. Loucks, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 440,908, Nov. 12, 1982, abandoned, which is a continuation of Ser. No. 264,484, May 18, 1981, abandoned. This application May 12, 1983, Ser. No. 493,862

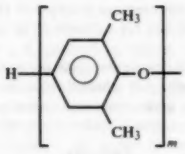
Int. Cl.³ C08L 53/00

U.S. Cl. 525—92 9 Claims

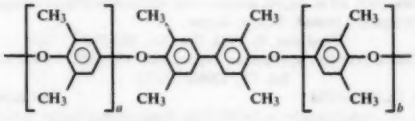
1. A polymer blend comprising:

(I) about 1–99 parts by weight of a block copolymer containing

(i) about 5–95 parts by weight of polyphenylene oxide segments having at least one of the formulas

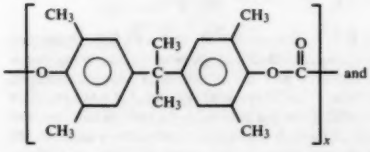


wherein m is at least 10, and

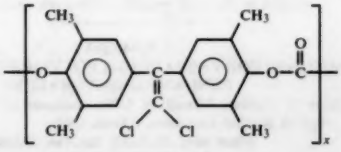


wherein either a or b is at least 1 and a+b is at least 10, and

(ii) about 95–5 parts of sterically hindered aromatic polycarbonate segments having at least one of the formulas



and



wherein x is at least 30; and

(II) about 99–1 parts of a vinyl aromatic resin.

4,446,279

COMPOSITIONS BASED ON A POLYSILOXANE AND AN ORGANO TITANATE AND THE USE THEREOF IN THE PREPARATION OF WATER CURABLE, SILANE MODIFIED ALKYLENE-ALKYL ACRYLATE COPOLYMERS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

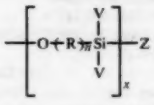
Continuation-in-part of Ser. No. 351,212, Feb. 22, 1982, which is a continuation-in-part of Ser. No. 192,319, Sep. 30, 1980, Pat. No. 4,328,323, which is a continuation-in-part of Ser. No. 70,785, Aug. 19, 1979, Pat. No. 4,291,136, which is a continuation-in-part of Ser. No. 892,153, Mar. 31, 1978, abandoned. This application Feb. 23, 1983, Ser. No. 467,318

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ C08F 8/00

U.S. Cl. 525—106 32 Claims

11. A composition, capable of reaction to produce a water curable, silane modified alkylene-alkyl acrylate copolymer comprising an alkylene-alkyl acrylate copolymer, an organo titanate in an amount sufficient to inhibit the adverse effects of moisture and a polysiloxane containing the repeating unit:



wherein R is a hydrocarbon radical or an oxy substituted hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group, Z is a hydrolyzable group, n is an integer having a value of 1 to 18 inclusive and x is an integer having a value of at least 2.

4,446,280

CROSSLINKING COMPOSITION CONTAINING ACTIVATED CARBOXYLIC ESTER POLYMER AND AMINE-TERMINATED TRIAZINE RESIN

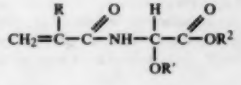
Susan M. Cady, Yardley, Pa.; Werner J. Blank, Wilton, and Peter J. Schirmann, Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 12, 1982, Ser. No. 377,504

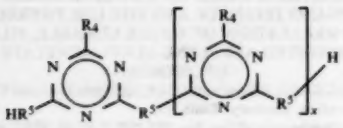
Int. Cl.³ C08F 20/58; C08L 35/00

U.S. Cl. 525—186 17 Claims

1. A crosslinking coating composition comprising (1) a vinyl polymer containing from about 1 to 100 weight percent of repeating units derived from a monomer of the formula



wherein the R group is selected from hydrogen and methyl, R′ is selected from hydrogen, alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms, and R^2 is selected from alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxy alkyls of 2–6 carbon atoms, and the balance of repeating units from one or more copolymerizable ethylenically-unsaturated comonomers and (2) as crosslinking agent an effective amount of a mixture of amine-terminated triazine resins of the average formula



wherein R^4 is hydrogen, NH_2, R_5H, group an aromatic, or aliphatic group of 1–18 carbon atoms, a cycloaliphatic group of 5–6 carbon atoms, or hydroxyalkylamine, R^5 is individually, a bridging unit derived from primary diamines selected from aliphatic of 2–14 carbon atoms, aromatic of 6–15 carbon atoms, cycloaliphatic of 5–15 carbon atoms, or $—NH(CH_2)_3—O—(CH_2)_y—O(CH_2)_3NH—$, y is an integer of 2–12, and x is an integer of 0–10.

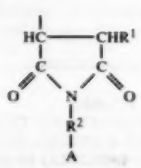
4,446,281

MODIFIED CIS-1,4-POLYISOPRENE RUBBER, A PROCESS FOR MANUFACTURING THE SAME, AND A COMPOSITION CONTAINING THE SAME

Hideo Takamatsu, and Shobu Minatono, both of Ibaraki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 19, 1982, Ser. No. 379,713
Claims priority, application Japan, May 26, 1981, 56-80641
Int. Cl.³ C08C *19/28*
U.S. Cl. 525—282 **10 Claims**

1. A modified cis-1,4-polyisoprene rubber, comprising: a solid synthetic cis-1,4-polyisoprene rubber having a side chain functional group of the formula (I) incorporated into said synthetic rubber, said modified rubber containing at least 0.01 mole of said functional group per 100 recurring units of isoprene monomer in said synthetic rubber:



(I)

wherein R^1 represents hydrogen, or a covalent bond with a rubber molecule, R^2 represents a hydrocarbon residue having not more than 20 carbon atoms, optionally containing an oxygen or sulfur atom in its principal chain, and A represents a dihydrocarbylamino residue having not more than 20 carbon atoms, or a heterocyclic residue having not more than 20 carbon atoms and containing at least one tertiary nitrogen atom alone as a hetero nitrogen atom.

5. A process for manufacturing modified cis-1,4-polyisoprene rubber, which comprises:

adding a compound selected from the group consisting of maleic anhydride, maleic acid, maleic acid monoesters and maleic acid diesters to solid synthetic cis-1,4-polyisoprene rubber having a molecular weight ranging from 200,000 to 2,000,000 in the quantity of at least 0.01 mole per 100 recurring units of isoprene monomer in said synthetic rubber;

reacting the resulting product with an amine of formula (II)

$$H_2N—R^2—A \quad \text{(II)}$$

wherein R^2 represents a hydrocarbon residue having not more than 20 carbon atoms, optionally containing an oxygen or sulfur atom in its principal chain, and A represents a dihydrocarbylamino residue having not more than 20 carbon atoms, or a heterocyclic residue having not more than 20 carbon atoms and containing at least one tertiary nitrogen atom alone as a hetero nitrogen atom; and

subjecting the reaction product to dehydration or dealcoholization to form an imide ring.

4,446,282

HIGH GREEN STRENGTH EMULSION RUBBERS BY THE USE OF HALF-ESTERS OF UNSATURATED DICARBOXYLIC ACIDS

George Jalics, Akron, Ohio, assignor to Goodyear Tire and Rubber Co., Akron, Ohio

Filed May 27, 1982, Ser. No. 382,543
Int. Cl.³ C08F *8/44*
U.S. Cl. 525—327.7 **17 Claims**

1. A process for improving the green strength of elastomers, comprising:

copolymerizing a monomer or monomers with from about 1 to 10 parts by weight per 100 parts of said monomer of a acid derivative, said monomer or monomers selected from the group consisting of (a) dienes having from 4 to 12 carbon atoms, (b) a diene having from 4 to 12 carbon atoms and a vinyl substituted aromatic having from 8 to 12 carbon atoms, (c) butadiene and acrylonitrile and optionally one or more monomers selected from the group consisting of acrylic, methacrylic and itaconic acids, and (d) polychloroprene, said derivative being a half ester or a half amide and being substantially hydrophobic, said derivative being the reaction product of (1) an alcohol or a saturated amine and (2) a dicarboxylic acid or acid anhydride; and

compounding said copolymer with between 1 and 5 parts of a divalent metallic salt selected from the group consisting of salts of zinc, magnesium and calcium.

4,446,283

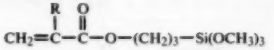
CROSSLINKABLE POLYETHYLENE RESIN COMPOSITION

Shuhei Doi; Tsutomu Isaka, both of Yokkaichi, and Shinichiro Iida, Mie, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,574
Claims priority, application Japan, Jun. 16, 1981, 56-92593
Int. Cl.³ C08G *77/20*
U.S. Cl. 525—344 **9 Claims**

1. A crosslinkable polyethylene resin composition which comprises:

a component (A) which is a copolymer consisting essentially of ethylene and an unsaturated silane compound represented by the following formula,



wherein, R is hydrogen or CH_3 and which has been prepared by copolymerization of monomers consisting essentially of ethylene and the unsaturated silane compound under a pressure of 500 to 4,000 kg./cm.^{2} at a temperature of 100° to 400° C. in the presence of a radical initiator; and

a component (B) which is a silanol condensation catalyst, the quantity thereof being in the range of 0.001 to 10% by weight of the total weight of the components (A) and (B).

4,446,284

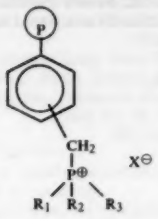
METHOD FOR PREPARING A POLYMER CONTAINING PENDANT UNSATURATION

Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1982, Ser. No. 383,046
Int. Cl.³ C08F *8/28, 8/40*
U.S. Cl. 525—383 **5 Claims**

1. A process for producing a polymer that contains pendant

unsaturated functionality which comprises: (a) reacting a polymer of the general structural formula:

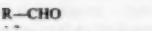


(I)

wherein

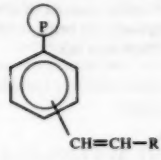
P is selected from the group consisting of homopolymers of vinylbenzylchloride, vinylbenzylchloride/styrene/-divinylbenzene terpolymers, butadiene/styrene/vinylbenzylchloride terpolymers, vinylbenzylchloride/-butadiene/acrylonitrile polymers, acrylonitrile/styrene/-vinylbenzylchloride terpolymers and isoprene/vinylbenzylchloride copolymers,

and wherein $X^{\ominus}$ is a halogen radical and R_1, R_2, and R_3 are the same or different radicals selected from the group comprised of phenyl or substituted phenyl radicals; (b) with an aldehyde of the structural formula:



(II)

wherein R is a hydrocarbon radical selected from the group consisting of aliphatic, cycloaliphatic, aromatic, aralkyl, heterocyclic, alkylene, polycyclic, cycloalkylene, alkylcycloalkylene, organometallic and polyaromatic radicals with the proviso that R may not contain an alkali ionizable functionality, (c) in the presence of an aqueous alkali metal base to yield a compound of the structural formula:



(III)

4,446,285

RUBBERY POLYCARBONATES

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 6, 1982, Ser. No. 447,030

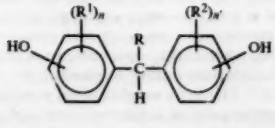
Int. Cl.³ C08L *69/00, 67/02*

U.S. Cl. 525—439 **95 Claims**

1. Thermoplastic resins exhibiting rubbery and elastomeric properties derived from:

(a) a carbonate precursor; and

(b) at least one dihydric phenol represented by the general formula



wherein:

R is selected from straight chain alkyl radicals containing from 12 to about 30 carbon atoms,

each R^1 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals,

each R^2 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals, and

n and n′ are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,446,286

ELECTRON BEAM CURABLE POLYRETHANE COMPOSITIONS

Edmond G. Kolycheck, Lorain, and Laura L. Tolle, Richfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 2, 1982, Ser. No. 404,152

Int. Cl.³ C08F *283/06*; C08G *65/32*; C08L *75/04*

U.S. Cl. 525—455 **12 Claims**

1. Electron beam-curable polyurethane compositions comprising (A) 100 weight parts of the reaction product of (1) hydroxyl-terminated polyesters, polyethers, polylactones, polycarbonates, polyepihalohydrins or polyhydrocarbon macropolyols, (2) unsaturated polyethers having an average of ½ to 18 double bonds per molecule, selected from the group consisting of polyethers having one terminal hydroxyl group and one terminal double bond group in amount of up to 20 weight percent, and polyether glycols having pendant double bond groups, in amounts of 5 to 100 weight percent, each based on the total polyols, and (3) an organic diisocyanate, in about an equimolar ratio of diisocyanate to the total polyols used, and (B) 1 to 25 weight parts of an acrylate or alkacrylate terminated polyurethane.

4,446,287

PRODUCTION OF VINYL CHLORIDE POLYMERS

Peter V. Smallwood, and Erno L. Zichy, both of Hertfordshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 12, 1982, Ser. No. 397,351

Claims priority, application United Kingdom, Jul. 20, 1981, 8122306

Int. Cl.³ C08F *2/24*

U.S. Cl. 526—81 **5 Claims**

1. A process for the production of a vinyl chloride polymer of high porosity and plasticiser absorption capacity which process comprises polymerising vinyl chloride in aqueous suspension in the presence of a suspension agent that is present in the polymerisation medium at the start of polymerisation and a free-radical yielding initiator wherein an effective surfactant which lowers the interfacial tension between 1,2-dichloroethylene and water to $\leqq 8$ dynes cm^{-1} (as measured at 20° C. on an aqueous surfactant solution containing 0.1% w/v surfactant) is injected into the polymerisation medium at a conversion of monomer to polymer within the range 15 to 65%.

4,446,288

POLYMERIZATION METHOD

Raymond E. Hoff, Palatine, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 260,802, May 5, 1981, Pat. No. 4,402,861. This application Jan. 4, 1982, Ser. No. 337,151

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—129 **5 Claims**

1. The method of polymerizing or copolymerizing ethylene which comprises polymerizing or copolymerizing said ethylene under polymerizing conditions in the presence of an alkyl aluminum cocatalyst and an olefin polymerization and copolymerization catalyst active in the presence of said cocatalyst, said catalyst being prepared by the consecutive steps of:

(a) preactivating and drying particles of silica by heating said particles at between about 200° C. and 900° C.;

(b) reacting said dry particles in the presence of a hydrocar-

bon solvent with butyl alcohol and a complex of the general formula $(MgR_2)_m(AlR_3)_n$ wherein R and R' are the same or different alkyl groups of 2 to 10 carbon atoms and m/n is between about 0.5 to 10, inclusive, to form a reaction mixture of said solvent and a first reaction product insoluble in said solvent, the molar ratio of said alcohol to said magnesium complex being in the range of about 0.5 to about 1.0;

(c) thereafter reacting said first reaction product in said reaction mixture with a halogen-containing titanium compound to form a second reaction product, the molar ratio of said magnesium compound to said titanium compound being about 1.0, and between about 2.25 and 2.50 mmoles of said titanium compound being present per gram of silica, said titanium compound comprising TiX_4 wherein X is a halogen atom; and

(d) removing said solvent from said second reaction product.

4,446,289

POLYMERIZING AND COPOLYMERIZING OLEFINICALLY UNSATURATED COMPOUNDS AND MEANS THEREFOR

Antonio Carbonaro, Milan; Cesare Ferrero, Monza, and Margherita Corbellini, Milan, all of Italy, assignors to Agip Petroli S.p.A., Rome, Italy

Filed Jul. 15, 1982, Ser. No. 398,649

Claims priority, application Italy, Jul. 29, 1981, 23212 A/81

Int. Cl.³ C08F 4/02, 10/00

U.S. Cl. 526—142 **23 Claims**

1. A process for the polymerization of alpha olefins, ethylene included, and copolymerization of said alpha olefins with one or more conjugated diolefins, which comprises contacting the monomers concerned with a plural-component catalytic system comprised of:

(a) the reaction product obtained by causing vapors of an electropositive and reducing metal to condense on a mixture of a titanium compound selected from among the halides and the alcoholates, and a halogenated organic or inorganic compound optionally in the presence of an inert thinner, and then heating the slurry thus obtained to a temperature between about 50° C. and about 100° C. in the presence of an alcohol;

(b) an aluminum trialkyl corresponding to the formula AlR_3 wherein R is an alkyl or an alkaryl radical; and

(c) an aluminum halide corresponding to the formula AlR_nX_{3-n} wherein X is Cl or Br and n is between 0 and 2.

4,446,290

PROCESS FOR PRODUCING CONJUGATED DIENE POLYMER

Takeshi Ikematu, and Yasuo Hattori, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1982, Ser. No. 361,754

Claims priority, application Japan, Mar. 27, 1981, 56-43993

Int. Cl.³ C08F 136/08, 236/08, 4/46, 4/50

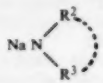
U.S. Cl. 526—174 **12 Claims**

1. A process for producing a conjugated diene polymer, a copolymer of a conjugated diene with at least one other conjugated diene, or a copolymer of a conjugated diene with an aromatic vinyl hydrocarbon comprising the step of polymerizing said monomer or monomers in the presence of an effective catalytic amount of a catalyst complex consisting essentially of the following components (a) and (b) or (a), (b) and (c):

(a)(1) an organosodium compound, having the general formula

$$R'(Na)_m$$

wherein R' is an aliphatic group, desirably having 1 to 30 carbon atoms, an alicyclic group, desirably having 5 to 30 carbon atoms, or an aromatic group, desirably having 6 to 30 carbon atoms or an unsaturated hydrocarbon group having at least one allyl hydrogen and desirably having 3 to 30 carbon atoms, and m is an integer of 1 through 4, (2) metallic sodium or (3) a sodium amide compound having the general formula



wherein

represents either a cyclized structure or a non-cyclized structure and R^2 and R^3 represent, in combination, a methylene chain having 2 to 10 carbon atoms in the case of a cyclized structure and R^2 and R^3 independently represent an aliphatic group, desirably having 1 to 30 carbon atoms, an alicyclic group, desirably having 5 to 30 carbon atoms, or an aromatic group, desirably having 6 to 30 carbon atoms in the case of a non-cyclized structure of (4) a mixture of at least one of the above components (1), (2), and (3) with an organic compound of sodium other than said sodium amide compound;

(b) an organic or organometallic compound of barium, strontium, or calcium; and

(c) an organometallic compound of an electron deficient metal selected from lithium, beryllium, magnesium, zinc, cadmium, boron, aluminum, gallium or indium, the amount of component (a) being 0.01 to 50 m mol per 100 g of the total monomers, the amount of component (b) being from 0.01 to 10 times the molar amount of component (a) and the amount of component (c) being from 0 to 5 times the molar amount of component (a).

4,446,291

PROCESS FOR THE CONTINUOUS PRODUCTION OF ACRYLONITRILE-VINYL CHLORIDE COPOLYMERS

Joachim König, Berg.Gladbach; Karl-Erwin Schnalke, Cologne; Carlhans Süling, Odenthal, and Horacek: Götz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,598

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633592

Int. Cl.³ C08F 214/06, 220/44

U.S. Cl. 526—209 **10 Claims**

1. A process for the continuous production of a chemically uniform copolymer having improved spinning properties comprising from 15 to 50% by weight of acrylonitrile and from 85 to 50% by weight of vinyl chloride and, optionally, up to 4% by weight of at least one other copolymerised ethylenically unsaturated comonomer containing acid groups by emulsion polymerisation, wherein the copolymerisation reaction is carried out with a monomer ratio of acrylonitrile to vinyl chloride of from 0.02 to 0.5 (ratio by weight), in the presence of a redox catalyst of compounds of sulphurous acid and peroxodisulphates in a molar ratio of reducing to oxidising component of from 8:1 to 100:1 and at a pH-value of from 2.5 to 4 wherein the total concentration of redox catalyst amounts to between 0.5 and 4% by weight, based on total monomer.

4,446,292

MOISTURE CURABLE COMPOSITIONS CONTAINING REACTION PRODUCTS OF HYDROPHOBIC POLYOLS AND MONOMER ORGANOSILICON-CONTAINING SUBSTANCES

Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1983, Ser. No. 462,596

Int. Cl.³ C08G 77/04

U.S. Cl. 528—29 **17 Claims**

1. A liquid composition comprising a reaction product prepared by reacting:

(A) at least one hydrophobic polyol; and

(B) an organosilicon-containing material comprising

(1) at least one organosilicon-containing substance free of functional groups attached to carbon and essentially free of alkali metal ions, having atoms bonded directly to Si, all of said atoms being selected from O, N, and/or Cl, said organosilicon-containing substance additionally having moieties directly bonded to Si which are displaceable by reaction with water and/or alcohol;

(2) optionally a nonfunctional organosilane, a hydrolyzed nonfunctional organosilane, or a mixture thereof; and

(3) optionally a functional organosilane, a hydrolyzed functional organosilane, or a mixture thereof;

wherein said reaction product has a ratio of milliequivalents of residual moieties from said organosilicon-containing material which are displaceable by reaction with water and/or alcohol to milliequivalents of hydroxyl moieties from said polyol greater than 1, is capable of self curing to a continuous film in the presence of moisture, and remains ungelled when subjected to a three-step gel test consisting of (1) heating a 10 gram sample of said reaction product in a glass jar covered with a cap at 149° C. for 240 minutes, followed by (2) heating said sample at 149° C. for 240 minutes in the presence of 0.5 grams of stannous octoate in said glass jar with a vent hole covered by a piece of masking tape in said cap, followed by (3) repeating step 2 except that no additional stannous octoate is introduced into said sample and said heating is conducted at a temperature of 204° C.

4,446,293

LOW-SOLVENT, THERMOSETTING REACTIVE POLYURETHANE COATING COMPOSITION, A PROCESS FOR ITS PRODUCTION AND ITS USE IN DIRECT AND REVERSE COATING PROCESSES

Eberhard König, Kronberg; Wilhelm Thoma, Leverkusen; Josef Pedain, Cologne, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,152

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120596

Int. Cl.³ C08G 18/10

U.S. Cl. 528—45 **10 Claims**

1. A low-solvent thermosetting reactive polyurethane coating composition which hardens to form light-fast polyurethane ureas with improved resistance to light, oxidation, heat and hydrolysis, characterized in that the coating composition comprises the following components in the following molar ratios:

(A) a ketoxime-blocked NCO-prepolymer of

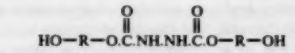
(1) 1 mole of 2- to 4-functional relatively high molecular weight polyhydroxyl compounds having a molecular weight in the range from about 1000 to 4000, wherein said 1 mole comprises

(a) from about 0.5 to 1.0 mole of a polyester carbonate having a molecular weight of from about 1000 to 4000 produced from diphenyl carbonate and ester glycols of ε-caprolactone and 1,6-hexane diol and

(b) up to about 0.5 mole of 2-functional to 4-functional relatively high molecular weight polyester polyols having a molecular weight of from about 1000 to 4000;

(2) from about 0.1 to 1.2 moles of low molecular weight polyols having molecular weights in the range from about 62 to 300, wherein said low molecular weight polyols comprise

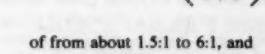
(c) from about 0.1 to 0.8 mole of bis-carbazinic ester polyols corresponding to the following general formula



in which R is a straight-chain and/or branched-chain C_1–C_5 -alkylene or hydroxyl-substituted alkylene radical and

(d) up to about 1.1 mole of low molecular weight polyols;

(3) aliphatic and/or cycloaliphatic diisocyanates in an NCO-:OH ratio between the components



of from about 1.5:1 to 6:1, and

(4) quantities of ketoximes substantially equivalent to the NCO-content;

(B) a crosslinking agent which comprises aliphatic and/or cycloaliphatic polyamines containing at least two primary amino groups at an NCO/NH_2 ratio of (A) to (B) between about 1.2:1 and 0.8:1; and

(C) up to about 40% by weight based on the total weight of the coating composition, of at least one organic solvent said organic solvent being sufficient to obtain a viscosity for the mixture of (A), (B) and (C) of from about 20,000 to 50,000 mPa.s at 20° C.

4,446,294

AROMATIC ETHERKETONE/SULPHONE COPOLYMERS

John B. Rose, and Michael B. Cinderey, both of Hertfordshire, England, assignors to Imperial Chemical Industries PLC, London, England

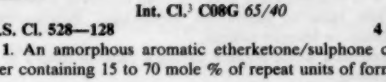
Filed Jun. 15, 1983, Ser. No. 504,476

Claims priority, application United Kingdom, Jul. 30, 1982, 8222063

Int. Cl.³ C08G 65/40

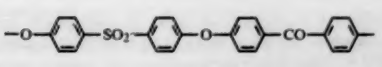
U.S. Cl. 528—128 **4 Claims**

1. An amorphous aromatic etherketone/sulphone copolymer containing 15 to 70 mole % of repeat units of formula



A

and correspondingly 85 to 30 mole % of repeat units of formula



B

4,446,295

THERMISTOR USING ORGANOPHOSPHAZENE POLYMER

Osamu Shibuta; Masayoshi Suzue, both of Tokushima, and Tetuo Hasegawa, Naruto, all of Japan, assignors to Otsuka Chemical Co., Ltd., Osaka, Japan

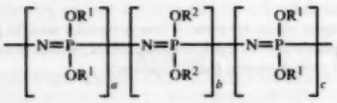
Filed Jul. 29, 1981, Ser. No. 288,030

Claims priority, application Japan, Sep. 13, 1980, 55-127626

Int. Cl.³ H01C *7/10, 7/13;* C08G *73/00, 83/00*

U.S. Cl. 528—168 **1 Claim**

1. A thermistor device comprising a body portion of a thermo-responsive material, said thermo-responsive material consisting essentially of an organophosphazene polymer of the following general formula:



wherein R^1 and R^2 are the same or different and each is phenyl group, a halogenated aryl group, an alkylaryl group whose alkyl group has 1 to 12 carbon atoms, or a fluoroalkyl group having 1 to 12 carbon atoms, and a, b and c are 0 or a positive integer within the range of $15 \leqq a+b+c \leqq 15{,}000$, and respective recurring units are randomly distributed; and at least two spaced electrical conductors in electrical contact with said body portion.

4,446,296

ACYLOXY TERMINATED POLYCARBONATES

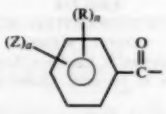
Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 17, 1982, Ser. No. 450,794

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—198 **26 Claims**

1. An aromatic polycarbonate resin chain terminated with at least one residue represented by the general formula



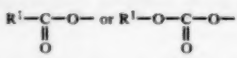
wherein:

each R is independently selected from monovalent hydrocarbon radicals, substituted monovalent hydrocarbon radicals, or halogen radicals;

a represents a whole number having a value of from 1 to 3 inclusive;

n represents a whole number having a value of from 0 up to the number of replaceable hydrogen atoms present on the ring carbon atoms of the aromatic nuclear residue; and

Z is independently selected from radicals represented by the general formulae



wherein R^1 is selected from bulky or rigid monovalent hydrocarbon radicals or bulky or rigid substituted monovalent hydrocarbon radicals.

4,446,297

THERMOPLASTIC COPOLYCARBONATE FROM HALOGEN FREE AROMATIC DIOL AND HALOGENATED THIODIPHENOL

Sivaram Krishnan, Moers, Fed. Rep. of Germany, and Arthur L. Baron, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 232,470, Feb. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 110,273, Jan. 7, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,453

Claims priority, application Japan, Dec. 26, 1980, 55-184165

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—204 **11 Claims**

1. In a thermoplastic polycarbonate based upon the reaction product of a halogen-free aromatic diol selected from the group consisting of

(i) dihydroxy diphenyl alkanes,

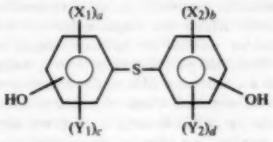
(ii) dihydroxy benzenes,

(iii) aromatic diols wherein the two aryl residues are linked by a sulfur-containing group, and

(iv) dihydroxy diphenyls

and a carbonic acid derivative, the improvement comprising:

a sufficient amount of a halogenated thiodiphenol co-reacted in said reaction product to impart flame retardant characteristics to said polycarbonate, said halogenated thiodiphenol being represented by the structural formula:



wherein X_1 and X_2 are halogen and Y_1 and Y_2 are alkyl radicals having 1 to 4 carbon atoms; and wherein a, b, c and d independently are integers from 0 to 4 with the proviso that the sum of said a and said b is from 1 to 8 and that the sum of said c and said d is from 0 to 7.

4,446,298

BRANCHED COPOLYCARBONATE FROM TRIPHENOL

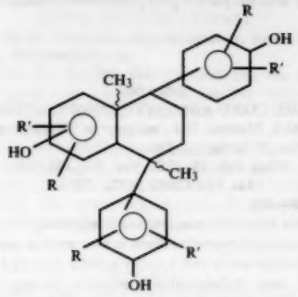
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 17, 1982, Ser. No. 451,107

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—204 **6 Claims**

1. A high molecular weight, thermoplastic, randomly branched polycarbonate of an aromatic dihydric phenol a carbonate precursor and a chain branching component, said randomly branched polycarbonate having an intrinsic viscosity of 0.30 to 1.0 dl/g in methylene chloride at 25° C. wherein the branching component comprises one or more compounds of the formula



where R and R′ are independently selected from hydrogen, C_1–C_5 alkyl, chloro, bromo or C_1–C_5 alkoxy.

4,446,299

MELT SPINNING OF SYNTHETIC FIBERS

Gunter Koschinek, Dietzenbach; Dietmar Wandel, Hanau; Bernd Kretschmann, Kahl, and Rolf Zinsser, Heusenstamm, all of Fed. Rep. of Germany, assignors to Davy McKee Aktienegesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 264,981, May 18, 1981, abandoned.
This application Jun. 6, 1983, Ser. No. 500,796
Int. Cl.³ C08G 63/02
U.S. Cl. 528—272 9 Claims

1. Improved synthetic spun fibers suitable for raw yarns for a friction unit texturing process or a gas jet turbulence process as well as for fabrication as "not drawn yarns" into fabrics and knits without the interpolation of a separate stretching operation, said synthetic fibers being characterized by a tension at 20 percent elongation (σ_{20}) of greater than or equal to 0.55 g/dtex, by a boiling shrinkage of less than 20 percent, by a permanent elongation of less than or equal to 10 percent, and by a modulus ($\sigma'(\delta)$), said modulus being characterized by $\sigma'(\delta)$ greater than or equal to zero for an elongation (δ) of greater than or equal to 10 percent, by a minimum value (σ'_{min}) in the elongation range of $\delta = 10$ to breaking extension f, said breaking extension f representing the elongation at the rupture of the first capillary, said minimum value (σ'_{min}) being greater than or equal to zero, and characterized by the difference $(\sigma_{f\sigma'} - \sigma_{min}) \div \sigma'_f$ being greater than or equal to zero, wherein f is the value of the final modulus at said rupture.

5. Synthetic fibers, as claimed in claim 1, wherein said synthetic fibers are made from polyester.

4,446,300

ISOCYANURATE-TYPE POLYMERS

David W. Mabrey; Daniel J. Lange, and Daniel J. Lee, all of St. Louis, Mo., assignors to The P. D. George Company, St. Louis, Mo.

Filed Jun. 27, 1983, Ser. No. 507,867
Int. Cl.³ C08G 63/44, 69/44
U.S. Cl. 528—288 32 Claims

1. In a process of preparing polymers containing tris(2-hydroxyethyl)isocyanurate, the improvement which comprises reacting ethylene carbonate and cyanuric acid in situ, wherein the molar ratio of ethylene carbonate to cyanuric acid is at least about 3 to 1.

4,446,301

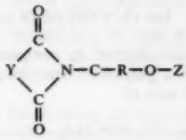
MODIFIED POLYESTERS

Stephen N. Belote; Don R. Leonard, both of Kingsport, Tenn., and Garrett C. Luce, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,942
Int. Cl.³ C08G 63/54, 63/48
U.S. Cl. 528—295.3 33 Claims

1. A novel modified polyester resin comprising the reaction product of

(A) an imide derived from an alkanolamine and an imide-forming reactant selected from phthalic acid, trimellitic acid, pyromellitic acid, maleic acid, succinic acid, anhydrides of the foregoing, and mixtures thereof, said imide having the formula



whereln R represents a branched alkyl group having about 2 to 10 carbon atoms; Y represents the residue of said imide-forming reactant; and Z represents hydrogen or the residue of a carboxylic acid or derivative thereof, provided that said imide provides at least one hydroxyl or carboxyl group which is available for reaction;

(B) a polyester-forming polyol;

(C) a polyester-forming multifunctional acid or derivative thereof; and, optionally,

(D) a fatty oil or an unsaturated fatty acid having about 12 to 24 carbon atoms derived from said oil,

wherein said alkanolamine is provided in an amount of about 0.5 to 30 percent by weight, based upon the total weight of reactants, and wherein said fatty oil or acid, if present, comprises about 30 to 60 percent by weight of said resin.

4,446,302

ELECTROSTATOGRAPHIC DEVELOPERS COMPRISING TONERS CONTAINING A POLYESTER HAVING P-HYDROXYBENZOIC ACID RECURRING UNITS

M. Akram Sandhu, Kingsport, Tenn.; John F. Wright, Penfield, and Michel F. Molaire, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 398,138, Jul. 14, 1982, Pat. No. 4,416,965.
This application Jul. 25, 1983, Ser. No. 517,142
Int. Cl.³ C08G 63/16
U.S. Cl. 528—302 8 Claims

1. A polyester having recurring units derived from diols and diacids and recurring units derived from p-hydroxybenzoic acid characterized in that from about 15-60 mole percent of the recurring units of said polyesters are derived from p-hydroxybenzoic acid.

4,446,303

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT POLYESTERS

Louis D. Moore; Mark Rule, and Thomas H. Wicker, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,485
Int. Cl.³ C08G 63/26, 63/70
U.S. Cl. 528—308.2 7 Claims

1. The process for solid-state polycondensing crystallizable, comminuted polyester comprising carrying out one or more times the intermediate step combination of removing said polyester from the reaction zone after a period of polycondensation, melting, recrystallizing, recomminuting the polyester,

and reintroducing the recomminuted polyester into said reaction zone and continuing said polycondensation until the desired I.V. is obtained.

4,446,304

HIGHLY STABLE NYLON 4,6 OBJECTS

Reinoud J. Gaymans, Boekelo, and Pieter J. van Asperen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 247,547, Mar. 25, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,337

Claims priority, application Netherlands, Mar. 26, 1980, 8001762; Canada, Mar. 25, 1981, 373813; Colombia, Mar. 25, 1981, 200472; European Pat. Off., Mar. 25, 1981, 81200325.9; Taiwan, Mar. 25, 1981, 7010850; European Pat. Off., Nov. 12, 1982, 82201432

Int. Cl.[3] **C08G** *69/26*

U.S. Cl. 528—335 **10 Claims**

1. A shaped article formed by compression or injection molding a melt of a polyamide, consisting essentially of a molecular chain of units of

$$-NH-(CH_2)_4-NH-CO(CH_2)_4-CO-$$

and which polyamide in the molded article has a relative viscosity of at least 2.5,

measured at 20° C., on a solution in 96% sulfuric acid, containing 1 g of polyamide in 100 ml of solution,

and which article has

a heat distortion temperature value of at least 100° C., and an IZOD impact resistance value of at least 5 kilojoules per square meter.

4,446,305

OPTICAL DEVICE INCLUDING BIREFRINGENT POLYMER

Howard G. Rogers, Weston; Ruth C. Bilofsky, Lexington, both of Mass.; Russell Gaudiana, Merrimack, N.H., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 238,054

Int. Cl.[3] **C08G** *69/32*

U.S. Cl. 528—348 **56 Claims**

1. An optical device comprising a transparent molecularly oriented highly birefringent polymer, said highly birefringent polymer comprising repeating molecular units exhibiting high electron density substantially cylindrically distributed about the long axes of the polymer and the repeating units thereof, said highly birefringent polymer being substantially optically uniaxial exhibiting only two indices of refraction.

4,446,306

OLIGOMER-CONTAINING MIXTURES USEFUL AS FIBER SURFACE TREATING AGENTS AND PROCESSES FOR THE PRODUCTION AND USE THEREOF

Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 20, 1982, Ser. No. 380,188

Int. Cl.[3] **C08G** *63/68*

U.S. Cl. 528—366 **10 Claims**

1. A process for the production of an oligomer-containing mixture useful as a fiber surface treating agent which comprises:

(a) reacting pyromellitic dianhydride with fluorinated alcohol at a mole ratio of fluorinated alcohol to pyromellitic dianhydride between about 1:0.55 and about 1:1.0 to form a partially esterified product having fluorinated ester groups, free acid groups and anhydride groups; and

(b) reacting the partially esterified product with an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin and propylene oxide in an amount sufficient to cause essentially all of the free acid groups and anhydride groups to be esterified.

4,446,307

TIRE CORD ADHESIVE COMPOSITION

James E. Shirk, Mantua, N.J., assignor to Wilmington Chemical Corporation, Wilmington, Del.

Filed Feb. 18, 1982, Ser. No. 349,851

Int. Cl.[3] **C08G** *59/02, 59/62*

U.S. Cl. 528—406 **12 Claims**

1. A stable adhesive composition comprising:

a polyfunctional epoxide which is the reaction product of a polyglycidyl ether and a water soluble polyhydroxy compound, said polyfunctional epoxide having an epoxy equivalent weight of at least about 130 and being soluble in water at a level up to about 5 percent by weight and a catalyst at a level wherein the catalytic activity corresponds to that of up to about 0.5 to about 0.8 percent by weight triethylamine based on the weight of the polyfunctional epoxide.

4,446,308

POLYMER RESIDUE TREATMENT

Charles A, Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1982, Ser. No. 393,282

Int. Cl.[3] **C08F** *8/50*

U.S. Cl. 528—481 **8 Claims**

1. A process for producing additional useful products by the treatment of polymeric residues formed upon reaction of a diolefin and a furfural which comprises subjecting said residue to pyrolysis at an elevated temperature in the range of about 500°–800° C. and for a period of time sufficient to convert said residue to additional quantities of diolefin, furfural, and desirable cotrimeric product.

4,446,309

METHOD AND APPARATUS FOR CONTINUOUSLY COAGULATING A RUBBERY POLYMER LATEX

Takashi Jiroumaru, Yokkaichi, and Mamoru Ito, Kuwana, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,515

Claims priority, application Japan, Mar. 5, 1981, 56-31624

Int. Cl.[3] **C08F** *6/22*

U.S. Cl. 528—486 **10 Claims**

1. A method for continuously coagulating a rubbery polymer latex to obtain a polymer solid, characterized in that into a coagulator consisting essentially of (a) a cylindrical body having at one end a nozzle for feeding rubbery polymer latex and a nozzle for feeding coagulant solution and having at the other end a discharging nozzle, (b) a stirrer mounted rotatably along the central axis of the cylindrical body, said stirrer having several stages of agitating blades, and (c) stationary blades fixed to the wall of the cylindrical body at the spaces between the stages of the agitating blades, are continuously fed the rubbery polymer latex and a coagulant solution through the above-mentioned respective nozzles in such proportions that the polymer solids content in the coagulator becomes 5–50% by weight based on the total weight of the latex and the coagulant solution so as to collide against each other, and subjected during their movement from the one end of the coagulator to the other end to highly fluidized state caused by a stirring power of at least 20 KW/m^3.

4,446,310
POLYACETYLENE WITH PYROGALLOL OR HYDROSULFITE SYSTEM
Robert D. Gleim, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Division of Ser. No. 219,405, Dec. 22, 1980, Pat. No. 4,356,301.
This application May 20, 1982, Ser. No. 380,324
Int. Cl.³ C08F 6/00
U.S. Cl. 528—487 16 Claims

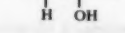
1. A process for reducing polyacetylene oxidation and embrittlement comprising the steps of treating said polyacetylene with a solution having a pH greater than 7, of a material selected from the class consisting of pyrogallol, sodium hydrosulfite, and potassium hydrosulfite.

4,446,311
PROCESS FOR PREPARING PULVERULENT ETHYLENE POLYMERS
John Hobes, Dinslaken; Wolfgang Payer, Wesel, and Detlef Deymann, Essen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany
Continuation of Ser. No. 216,224, Dec. 15, 1980, abandoned.
This application Jun. 14, 1982, Ser. No. 388,572
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951122
Int. Cl.³ C08F 8/22
U.S. Cl. 528—493 16 Claims

1. A process for preparing pulverulent ethylene homo/-copolymers with a grain size <200 μm, which comprises contacting coarse-particles ethylene homopolymers or copolymers with an aliphatic ketone selected from the group consisting of methyl ethyl ketone, methylisopropyl ketone, methylisobutyl ketone and mixtures thereof, heating the suspension to a temperature above the softening point range of the polymer and thereafter cooling the suspension.

4,446,312
C-β-D-XYLOPYRANOSIDE SERIES COMPOUNDS
Ryoji Noyori, Aichi; Sakaru Suzuki, and Minoru Okayama, both of Nagoya, all of Japan, assignors to Seikagaku Kogyo Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 319,392, Nov. 9, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,085
Claims priority, application Japan, Nov. 13, 1980, 55-158855
Int. Cl.³ C07H 7/02
U.S. Cl. 536—1.1 11 Claims

1. C-β-D-xylopyranoside series compounds having the general formula:



in which R denotes a lower alkyl group having from 1 to 5 carbon atoms.

4,446,313
POLYETHER POLYOL PROCESS
Peter Dix; George A. Pogany, and Parminder Sangha, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed Jul. 21, 1981, Ser. No. 285,653
Claims priority, application United Kingdom, Aug. 6, 1980, 8025696
Int. Cl.³ C07H 1/00
U.S. Cl. 536—18.6 9 Claims

1. A process for the manufacture of a polyether polyol which process comprises reacting sucrose or sorbitol with ethylene oxide, propylene oxide or a mixture thereof at a temperature ranging from about 80° C. to about 120° C. and at a pressure of up to 6 bar in the presence of a catalyst which comprises: (a) a tertiary amine NRR'_2, in which R is a cycloalkyl or cycloalkenyl group and each R' may be an alkyl, cycloalkyl or cycloalkenyl group and (b) a nitrogen compound containing in the molecule at least one hydrogen atom which is capable of reacting with alkylene oxides.

4,446,314
FRACTIONATION OF HEPARIN
Robert E. Jordan, Concord, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.
Division of Ser. No. 192,286, Sep. 30, 1980, Pat. No. 4,386,025.
This application Sep. 29, 1982, Ser. No. 426,541
Int. Cl.³ C08B 37/10; A61K 31/725
U.S. Cl. 536—21 4 Claims

1. A method of fractionating unfractionated heparin into components of differing activity, which comprises -

(a) contacting the unfractionated heparin with a composition for fractionating heparin into components of differing activity by virtue of differing affinity for antithrombin which comprises a lectin-containing, water-insoluble gel matrix having reversibly bound thereto antithrombin specific for gradiently binding the components of differing activity in heparin, and

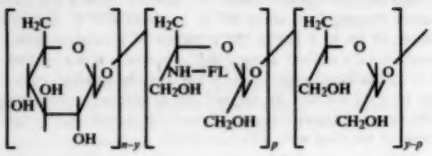
(b) selectively separating the components of differing activity from the composition.

4,446,315
ADENOSINE 5'-TRIPHOSPHATE-4-CARBOXAMIDE-RIBOFURANOSYLTHIAZOLE
Victor E. Marquez, Gaithersburg; David A. Cooney, Bethesda; Gulilat Gebeyehu, Silver Spring, and Hiremagalur N. Jayaram, Gaithersburg, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Sep. 24, 1982, Ser. No. 423,241
Int. Cl.³ C07H 19/20
U.S. Cl. 536—27 1 Claim

1. 2-β-D-Ribofuranosylthiazole-4-carboxamide 5'→5'-adenosine pyrophosphate and pharmaceutically acceptable acid addition salts.

4,446,316
DEXTRAN DERIVATIVE OF FIBRINOLYSIN
Evgeny I. Chazov; Vladimir N. Smirnov; Vladimir P. Torchilin, all of Moscow; Igor M. Tereshin; Boris V. Moskvichev, both of Leningrad; Grigory M. Grinberg, Moscow; Agris Z. Skuya, and Gersh I. Kleiner, both of Riga, all of U.S.S.R., assignors to Vsesojuzny Kardiologichesky Nauchny Tsentr, Moscow, U.S.S.R.
Filed Dec. 9, 1981, Ser. No. 329,025
Claims priority, application U.S.S.R., Dec. 31, 1980, 3230869
Int. Cl.³ C08B 37/02
U.S. Cl. 536—112 5 Claims

5. A polysaccharide derivative of fibrinolysin which is water soluble and has prolonged thrombolytic activity, obtained by reacting fibrinolysin with dextran dialdehyde to form a covalent bond and reducing the product, said derivative being represented as follows:



wherein

FL is fibrinolysin

n is 100 mol % of glucopyranose units of dextran

y is 10-25 mol % of oxidized glucopyranose units of dextran

p is the molar percentage of NH_2 groups of fibrinolysin bonded to dextran, and

wherein the content of fibrinolysin is 10 to 30 mol % and the content of dextran 90 to 70 mol %.

4,446,317

CEPHALOSPORIN ANTIBIOTICS

Michael Gregson, Middlesex, and Richard B. Sykes, Chalfont St Giles, both of England, assignors to Glaxo Operations U.K. Limited, London, England

Continuation of Ser. No. 176,520, Aug. 8, 1980, abandoned, which is a continuation of Ser. No. 61,259, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 921,119, Jun. 30, 1978, abandoned, which is a continuation of Ser. No. 768,719, Feb. 15, 1977, abandoned. This application Jan. 27, 1982, Ser. No. 343,326

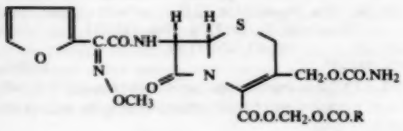
Claims priority, application United Kingdom, Feb. 16, 1976, 6010/76; Jul. 30, 1976, 27300/76

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ C07D *501/34*

U.S. Cl. 544—22 **6 Claims**

1. The syn isomer of a cephalosporin antibiotic of the formula



(I)

(where R is a primary or secondary alkyl group containing 1 to 4 carbon atoms).

4,446,318

METHOD FOR PRODUCING 7-AMINOCEPHEM COMPOUNDS

Kenzo Naito, Kyoto; Haruo Shinbo, Nishinomiya, and Kazuo Tsukamura, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

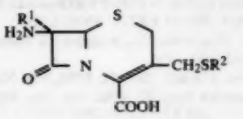
Filed Nov. 6, 1981, Ser. No. 318,960

Claims priority, application Japan, Nov. 11, 1980, 55-159208; Jun. 17, 1981, 56-93293

Int. Cl.³ C07D *501/04, 501/02*

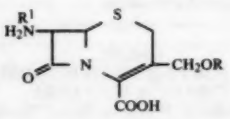
U.S. Cl. 544—26 **12 Claims**

1. In the method for producing a 7-aminocephem compound of the formula:



[II]

wherein R^1 is a hydrogen atom or methoxy group and R^2 is a residue of a thiol compound, or a salt or ester thereof which comprises reacting a compound of the formula:



[I]

wherein R^1 is as defined above and R is a carboxylic acid acyl group, or a salt or ester thereof with a thiol compound or a salt thereof, wherein the improvement comprises conducting said reaction in an organic solvent in the presence of a dihalophosphoric acid.

4,446,319

AMINOCYCLITOLS AND THEIR PRODUCTION

Satoshi Horii, Sakai, and Hiroshi Fukase, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

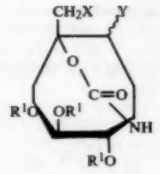
Filed Apr. 26, 1982, Ser. No. 371,988

Claims priority, application Japan, Apr. 28, 1981, 56-64370; Sep. 11, 1981, 56-144309

Int. Cl.³ C07D *265/18*

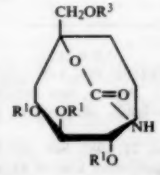
U.S. Cl. 544—92 **10 Claims**

1. A compound of the formula

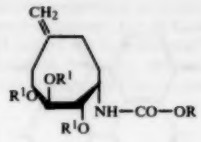


wherein X is hydroxyl group, a halogen or an acyloxy group; Y is hydrogen or a halogen; and OR^1 is an optionally protected hydroxyl group.

8. A process for producing a compound of the formula

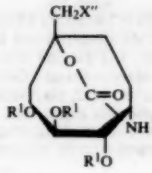


wherein OR^1 is an optionally protected hydroxyl group, and OR^3 is an acyloxy group, which comprises reacting a compound of the formula



wherein R is an alkyl, aryl or aralkyl group; and OR^1 is as defined above:

with a halogenating agent to afford a compound of the formula



wherein X" is a halogen; and OR^1 is as defined above; then reacting the resultant compound with an acyloxylating agent.

4,446,320

MORPHOLINE COMPOUNDS PREPARED VIA PHOSPHATE CATALYSTS

Victoria Eskinazi, Cleveland Heights, Ohio, and James E. Wells, Bryn Mawr, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 381,233, May 24, 1982. This application Dec. 20, 1982, Ser. No. 451,295

Int. Cl.³ C07D *295/02*

U.S. Cl. 544—106 **10 Claims**

1. A process which comprises converting a diglycolamine compound to a morpholine compound at a temperature in the range of about 285° C. to 420° C., a pressure in the range of about 0.1 to 150 atmospheres, a liquid hourly space velocity of about 0.05 to 1.5 in the presence of a catalyst selected from the group consisting of the pyrophosphate, the monohydrogen and dihydrogen phosphate of strontium and mixtures thereof.

4,446,321

4-ARYL-BIS 2,6-(AMINOPHENYL)PYRIDINES

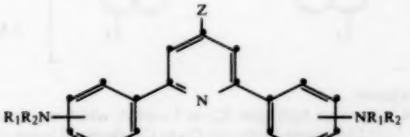
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 243,798, Mar. 16, 1981, Pat. No. 4,363,505. This application Jun. 3, 1982, Ser. No. 384,571

Int. Cl.³ C07D *213/38*

U.S. Cl. 544—124 **29 Claims**

1. A compound having the formula

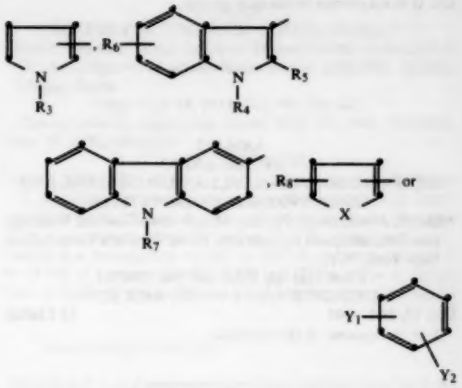


wherein:

R_1 and R_2 are the same or different and are selected from the group consisting of lower-alkyl and benzyl, or

NR_1R_2 is pyrrolidinyl, piperidinyl, or morpholinyl;

Z is naphthyl, 9-julolidinyl or a substituent having the formula:



wherein

R_3, R_4, R_7 and R_8 are hydrogen or non-tertiary lower-alkyl;

R_5 is hydrogen, phenyl or non-tertiary lower-alkyl;

R_6 is hydrogen, non-tertiary lower-alkyl or non-tertiary lower-alkoxy;

X is O or S;

Y_1 and Y_2 are the same or different and are selected from the group consisting of hydrogen, lower-alkyl, lower-alkoxy, halo, nitro, lower-alkoxycarbonyl, phenyl or NR_9R_{10};

R_9 is lower-alkyl or benzyl;

R_{10} is lower-alkyl, benzyl, cyano-lower-alkyl, or

NR_9R_{10} is pyrrolidinyl, piperidinyl, morpholinyl or isoindolinyl.

4,446,322

HYDROXYL PROTECTED 3-(2-HYDROXY-2-PHENYLETHYL)-N-[(PHENYLAMINO)CARBONYL]SYDNONE IMINE INTERMEDIATES

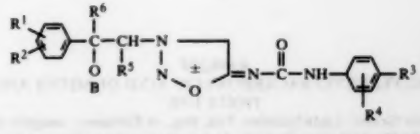
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 171,423, Jul. 29, 1980, Pat. No. 4,277,609, which is a continuation-in-part of Ser. No. 71,606, Aug. 31, 1979, abandoned. This application Oct. 2, 1980, Ser. No. 193,042

Int. Cl.³ C07D *295/10, 271/04*

U.S. Cl. 544—138 **9 Claims**

1. A hydroxyl protected 3-(2-hydroxy-2-phenylethyl)-N-[(phenylamino)carbonyl]sydnone imine derivative of the formula:



in which the enantiomeric form is d,l or l when R^5 is hydrogen and d,l-threo or l-threo when R^5 is other than hydrogen;

R^1 and R^2 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms halo, perfluoroalkyl of 1 to 3 carbon atoms, nitro, alkanoyl of 2 to 4 carbon atoms, or alkoxycarbonyl of 2 to 4 carbon atoms;

R^3 is hydrogen, halo, nitro or alkanoyl of 2 to 4 carbon atoms;

R^4 is hydrogen, halo, nitro or perfluoroalkyl of 1 to 3 carbon atoms;

R^5 and R^6 are, independently, hydrogen or methyl;

and B is a hydroxy protecting group.

4,446,323

TETRA- AND HEXA-HYDROPYRROLO(1,2-A)QUINOXALINE AND AZAQUINOXALINE DERIVATIVES

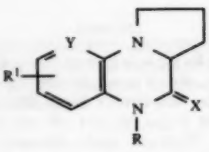
Meier E. Freed, Paoli, Pa., and Magid Abou-Gharbia, Wilmington, Del., assignors to American Home Products Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 496,791

Int. Cl.³ C07D *471/14, 487/04;* A61K *31/495*

U.S. Cl. 544—344 **15 Claims**

1. A compound of the formula:



in which

X is O or H_2;

Y is CH or N;

R is hydrogen, alkyl of 1 to 6 carbon atoms, dialkylaminoalkyl in which each alkyl group contains 1 to 6 carbon atoms, arylalkyl of 7 to 16 carbon atoms, phenoxyalkyl of 7 to 12 carbon atoms, benzoyl, 4-pyridylalkyl of 6 to 11 carbon atoms, substituted phenylalkyl, substituted benzoyl or substituted phenoxyalkyl wherein the substitution on said phenylalkyl, benzoyl or phenoxyalkyl moieties is by 1, 2 or 3 substituents independently selected from alkyl, alkoxy, nitro, halo, trifluoromethyl, amino, alkylamino and dialkylamino substituents wherein each of said alkyl or alkoxy groups in said substituents contains from 1 to 6 carbon atoms;

with the proviso that when R is hydrogen, Y is N; and

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro, halo, trifluoromethyl, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino in which each alkyl group contains from 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,446,324

PERYLENETETRACARBOXYLIC ACID DIIMIDES AND THEIR USE

Fritz Graser, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,073

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049215; Sep. 17, 1981, 3136894

Int. Cl.³ C09B *3/16*

U.S. Cl. 546—37 **1 Claim**

1. Perylene-3,4,9,10-tetracarboxylic acid diimide of the formula

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4,446,325

1,4-DIHYDROPYRIDINE COMPOUNDS

Sachio Ohno; Kiyoshi Mizukoshi; Osamu Komatsu, all of Aichi; Kenzi Ichihara, Gifu, and Takashi Morishima, Aichi, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Nagoya, Japan

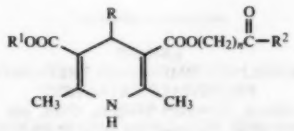
Filed Oct. 19, 1982, Ser. No. 435,183

Claims priority, application Japan, Oct. 19, 1981, 56-166963; Jan. 11, 1982, 57-2597; Feb. 25, 1982, 57-28391

Int. Cl.³ C07D *213/55, 405/12, 409/12*

U.S. Cl. 546—283 **9 Claims**

1. A 1,4-dihydropyridine compound represented by the formula



wherein R represents a 2- or 3-nitrophenyl group, R^1 represents a straight or branched chain alkyl group having 1 to 4 carbon atom, R^2 represents hydrogen or a methyl group, X represents an oxygen atom, an ethylenedioxy group, a propylenedioxy group, an ethylenedithio group, a propylenedithio group or an ethylene group, and n is an integer of 1 or 2.

4,446,326

CATIONIC NAPHTHOLACTAM DYESTUFFS

Alfred Brack, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

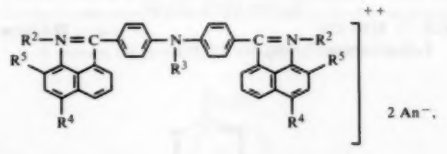
Filed Sep. 30, 1981, Ser. No. 307,255

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039116

Int. Cl.³ C09B *57/06*

U.S. Cl. 548—438 **4 Claims**

1. Cationic dyestuffs of the formula



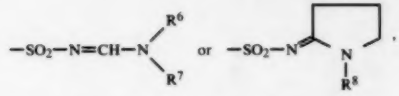
wherein

R^2 represents hydrogen, C_1- to C_4-alkyl, which can be substituted by cyano, hydroxyl, C_1- to C_4-alkoxy, chlorine, C_1- to C_4-alkoxycarbonyl, aminocarbonyl, mono-C_1- to C_4-alkylaminocarbonyl or di-C_1- to C_4-alkylaminocarbonyl,

R^3 represents hydrogen or C_1- to C_4-alkyl and

R^4 represents hydrogen, chlorine, bromine, C_1- to C_4-alkylcarbonylamino, benzoylamino, methylsulphonylamino, phenylsulphonylamino, C_1- to C_4-alkylsulphonyl, phenylsulphonyl,

aminosulphonyl, mono-C_1- to C_4-alkylaminosulphonyl, di-C_1- to C_4-alkylaminosulphonyl, monophenylaminosulphonyl, diphenylaminosulphonyl, C_1- to C_4-alkylmercapto, in which the alkyl radical can be substituted by carboxyl, C_1- to C_4-alkoxycarbonyl, hydroxyl, methoxy or ethoxy, or represents phenylmercapto, carboxyl, cyano or a radical of the formulae



R^5 represents hydrogen, chlorine or bromine,

R^6 and R^7 represent C_1- to C_4-alkyl, phenyl or benzyl, or, together with the nitrogen, represent a pyrrolidine, piperidine or morpholine ring,

R^8 represents hydrogen, C_1- to C_4-alkyl, phenyl or benzyl and An^- represents an anion, and wherein

the phenyl radicals mentioned can be substituted with nonsterically hindering C_1- to C_4-alkyl, chlorine, bromine, hydroxyl or C_1- to C_4-alkoxy.

4,446,327

PROCESS FOR THE PREPARATION OF 3-CHLOROPHTHALIDE

Greger Weisgerber, Königswinter, and Klaus-Dieter Steffen, Hennef, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 154,736, May 30, 1980, abandoned, which is a continuation of Ser. No. 13,498, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 782,486, Mar. 29, 1977, abandoned. This application May 6, 1982, Ser. No. 375,637

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614449

Int. Cl.³ C07D *307/77*

U.S. Cl. 549—307 **7 Claims**

1. Process for the preparation of 3-chlorophthalide by hydrolysis of pentachloro-o-xylene, characterized in that pentachloro-o-xylene is hydrolyzed with 1.8–2.2 mols of water per mol of pentachloro-xylene at temperatures above 100° C., in the presence of a Lewis acid catalyst, by proportioning of the water into the reaction mixture at the rate at which it reacts to form HCl.

4,446,328

PROCESS FOR PRODUCING METHACROLEIN

Atsushi Aoshima, Yokohama, and Ryoichi Mitsui, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1981, Ser. No. 263,667

Claims priority, application Japan, May 19, 1980, 55-66088; May 19, 1980, 55-66089

Int. Cl.³ C07C *45/32*

U.S. Cl. 568—479 **5 Claims**

1. A process for producing methacrolein by oxidizing isobutylene or tertiary butanol with molecular oxygen in the presence of a catalyst, characterized in that the oxidation is conducted at a temperature of 200° to 550° C. at a pressure of 9.5 to 10 atm at a space velocity of 100 to 5,000 hr^{-1} for a contact time of 0.1 to 15 sec and the catalyst has the general composition:

$$Mo_{12}Fe_aNi_bTe_cX_dZ_fY_gO_h$$

wherein a, b, c, d, f and g represent the numbers of atoms of the respective elements per 12 molybdenum atoms; X is Tl, Rb or Cs; Z is In or Ti; Y represents at least one element selected from the group consisting of Cu, Nd, Sm and Pb; a is a value of 0.2–6; b is a value of 0.2–6; a+b is a value of 1–10; c is a value of 0.1–4; d is a value of 0.1–3; f is a value of 0.1–3; g is a value of 0–5; and h is the number of oxygen atoms for satisfying the valencies of the existing elements.

4,446,329

ALKYLATION OR AROMATIC COMPOUNDS

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 24, 1983, Ser. No. 478,543

Int. Cl.³ C07C *2/66*

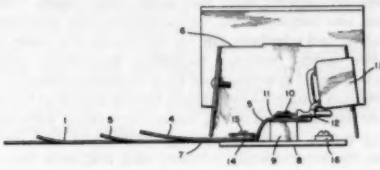
U.S. Cl. 585—458 **15 Claims**

1. Improved catalytic process for the alkylation of aromatic substrates, the improved process characterized in that it is carried out at at least 200° C. and the catalyst is a metal cation salt of a perfluorosulfonic acid polymer having an equivalent weight of about 500 to about 20,000, the metal cation having a log K_{11} greater than -10.

4,446,330
ELECTRICAL SERVICE MODULE WITH STRAIN RELIEF MEMBER

Urs F. Nager, Jr., Bethel, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Oct. 26, 1981, Ser. No. 314,964
Int. Cl.³ H02G *3/10*
U.S. Cl. 174—51 **4 Claims**

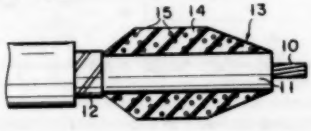


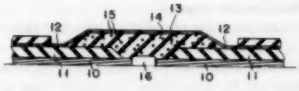
1. An electrical service module in a flat conductor cable wiring system, comprising:
   a. a housing;
   b. an insulating member within the housing for mounting a portion of a flat conductor cable thereon;
   c. a wiring structure extending into the housing which comprises a flat conductor cable and a flat conductive grounding shield;
   d. a clamping member attached to the inside of the housing;
   wherein said wiring structure is confined between said clamping member and a portion of said housing;
   wherein said cable extends from the clamping member to, and is mounted on said insulating member by fasteners which are electrically connected to said cable; and
   wherein the flat conductive grounding shield is terminated within said housing and is at least partially wrapped around said clamping member in a direction opposite to that from which it enters said clamping member.

4,446,331
POWER CABLE JOINT STRUCTURE INCLUDING A REINFORCEMENT INSULATOR CONTAINING ELECTRODE SPHERICAL BODIES

Michio Takaoka, Chiba; Motoyuki Ono, Sakura; Isao Kaji, Ichikawa, and Shigeki Yagi, Yachiyo, all of Japan, assignors to The Fujikura Cable Works, Limited, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,139
Claims priority, application Japan, Jul. 17, 1981, 56-106944[U]
Int. Cl.³ H02G *15/068, 15/188*
U.S. Cl. 174—73 R **3 Claims**



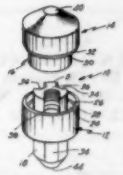


1. A power cable joint structure comprising:
conductor means;
cable insulator covering the conductor means;
cable shielding layer wound about the cable insulator; and
reinforcement insulator means covering an exposed portion of the cable insulator for controlling the voltage distribution between the conductor means and the cable shielding layer, said reinforcement insulator means containing electrode spherical bodies.

4,446,332
WIRE CONNECTOR

William C. Dauser, Jr., North Muskegon, Mich., assignor to Lloyd A. Heneveld, Grand Rapids, Mich., Trustee of Dauser Trust IV— Solderless Connector

Continuation-in-part of Ser. No. 99,624, Dec. 3, 1979. This application Sep. 14, 1981, Ser. No. 301,765
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.³ H01R *11/00*
U.S. Cl. 174—87 **11 Claims**

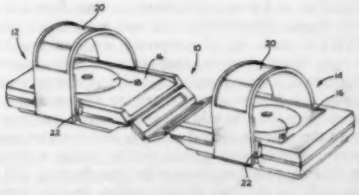


1. A self-stripping solderless electrical connector comprising:
   an elongated body of insulating material having wire receiving channels formed along at least a portion of its length for receiving electrical wire covered with insulation;
   support means of insulating material having a conductive member fixed thereto, said support means and said conductive member being adapted for linear movement along a portion of said elongated body and said channels in response to a linear force directed along the elongated axis of said body, said conductive member adapted to engage a plurality of insulated wire conductors positioned in said channels, cut through the insulation thereof, and engage wire conductors to provide an electrical connection therebetween upon said movement of said support means and conductive member along said elongated body;
   and means including releasable fixing means for attaching one end of said support means in a predetermined position on said body, in which position the channels each can receive a separate insulation covered, electrical wire before said movement of said support means and conductive member relative to said body; said fixing means being releasable in response to said linear force moving said support means and said conductive member.

4,446,333
FLEXIBLE ACOUSTIC COUPLER

Bayard F. Kessler, Woodland Hills, Calif., assignor to Novation, Inc., Chatsworth, Calif.

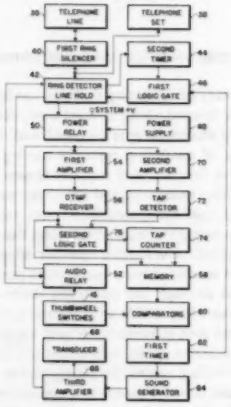
Filed Oct. 14, 1981, Ser. No. 311,173
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 C **11 Claims**



1. An acoustic coupler comprising:

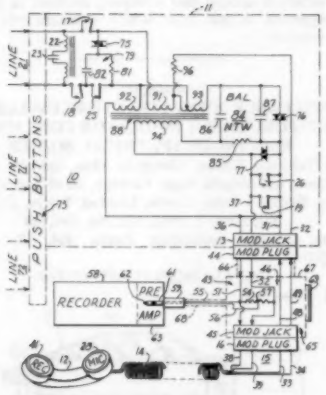
a first half member housing a speaker therewithin;
a second half member housing a microphone therewithin;
a flexible hinge means coupling said first half member to said second half member, said flexible hinge means having at least three substantially parallel predefined hinge axes, said flexible hinge means being a means for enabling the position and orientation of said first half member to be independently varied with respect to said second half member through a predetermined range of relative spatial positions and angular orientations with good flexibility with respect to the degrees of freedom required to mate said acoustic coupler with substantially all telephone handsets while providing substantial resistance to relative motion unnecessary to such proper mating and tending to make the use of said acoustic coupler inconvenient and cumbersome.

4,446,334
TELEPHONE NUMBER CODING DEVICE
James W. Groff, P.O. Box 38, Morgan Hill, Calif. 95037
Filed Jan. 31, 1983, Ser. No. 432,272
Int. Cl.[3] H04M *1/21, 11/02*
U.S. Cl. 179—81 R **16 Claims**



1. A telephone number coding device for eliminating unwanted telephone calls, intended to be connected between a telephone line and a telephone set, said coding device comprising in combination: a first ringer silencing means connected in series between said telephone line and telephone set for silencing a ringer mechanism of said telephone set; ring detector means connected in parallel with said telephone line, and line hold means connected in parallel with said telephone set, said ring detector means actuating said line hold means in response to ring signals appearing on said telephone line for automatically answering a telephone call and placing said call on hold; power relay means operatively associated with said line hold means for switching power to said coding device in response to actuation of said line hold means; audio relay means cooperating with said line hold means and telephone line for transferring sound to and from said telephone line; first and second amplifier means cooperating with said audio relay means for amplifying an audio signal comprising a special number code dialed by a caller to access said coding device; receiver and detector means cooperating with said first and second amplifier means for receiving and detecting the presence of said special number code on said telephone line; a memory associated with the outputs of said receiver and detector means for temporarily storing said special number code; a plurality of indicia bearing switching means for preselecting said special number code by the user of said coding device; comparator means cooperating with the outputs of said memory and said plurality of indicia bearing switching means for comparing a dialed special number code with a preselected special number code and providing a logic signal when both codes are identical; a first timing means actuated by said logic signal for providing a predetermined timed interval when said codes are identical; sound generator and third amplifier means actuated by said first timing means for generating and amplifying simulated ring signals in response to a correctly dialed special number code, said sound generator and third amplifier means further cooperating with said audio relay means, line hold means, and telephone line for transferring said simulated ring signals to said telephone line for the benefit of a caller accessing said coding device; a transducer operatively associated with said sound generator and third amplifier means for reproducing said simulated ring signals for the benefit of the coding device user; a second timing means cooperating with said first timing means, associated gating means, and said line hold means for automatically releasing said telephone line subsequent to a predetermined timed delay when said special number code is incorrectly dialed; and a second ringer silencing means connected in series between said telephone line and an extension telephone for silencing a ringer mechanism of an extension telephone cooperating with said telephone set.

4,446,335
TELEPHONE SIGNAL RECORDING METHODS AND APPARATUS
Charles E. Lee, Miller Place, N.Y., and C. Marlon Combs, Claremont, Calif., assignors to Dynametric, Inc., Pasadena, Calif.
Filed Jan. 25, 1982, Ser. No. 342,253
Int. Cl.[3] H04M *11/00*
U.S. Cl. 179—2 C **40 Claims**



1. A method of recording an audio signal at a telephone set having a housing and a handset connected to a first modular jack in said housing via a handset cord having at an end thereof a first modular plug fitting into said first modular jack, comprising in combination the steps of:
providing a second modular plug fitting into said first modular jack;
providing a second modular jack for receiving said first modular plug;
providing an electrical interconnection of said second modular jack with said second modular plug;
inserting said second modular plug into said first modular jack and said first modular plug into said second modular jack;
tapping said audio signal from said electrical interconnection of said second modular jack with said second modular plug; and

recording said tapped audio signal.

21. Apparatus for recording an audio signal at a telephone set having a housing and a handset connected to a first modular jack in said housing via a handset cord having at an end thereof a first modular plug fitted into said first modular jack, comprising in combination:

a second modular plug fitting into said first modular jack;

a second modular jack for receiving said first modular plug;

an electrical interconnection of said second modular jack with said second modular plug;

means connected to said interconnection for tapping said audio signal from said electrical interconnection of said second modular jack with said second modular plug; and

means connected to said tapping means for recording said tapped audio signal.

4,446,336

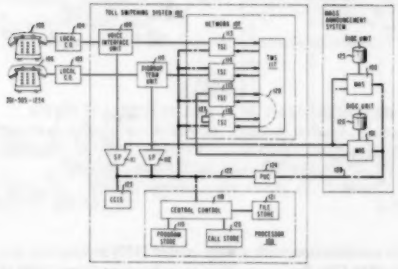
METHOD FOR RECORDING AND UPDATING STORED MESSAGES IN AN ANNOUNCEMENT SYSTEM

Leslie D. Bethel, Naperville; Howard A. Kerr, West Chicago; Frances B. Strebendt, Wheaton, all of Ill., and John E. Waninski, Jr., Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1981, Ser. No. 233,001

Int. Cl.³ H04M *1/64, 1/66*

U.S. Cl. 179—6.10 **7 Claims**



1. For use in a telephone network having announcement equipment for storing recorded announcements for transmittal over the network and a switching office for selectively interconnecting telephone stations with said equipment, a machine method operative from one of said stations for updating a particular stored one of said recorded announcements comprising the steps of

transmitting a new standby announcement over a first connection to said announcement equipment,

upon receipt of said standby announcement establishing a second connection from said office to a station designated by said office for verification of the standby announcement,

retransmitting said standby announcement over said second connection in response to a signal from said designated station, and

replacing the particular stored announcement with the standby announcement in the event the switching office interrupts the second connection before a second signal is received from said designated station.

4,446,337

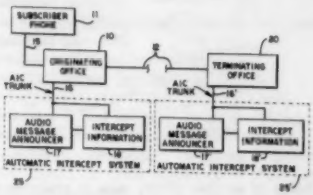
METHOD AND APPARATUS FOR REVERTIVE AUTOMATIC INTERCEPT MESSAGE DELIVERY IN A TELEPHONE SYSTEM

Frank H. Cofer, Hoschton, Ga., assignor to The Audichron Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 59,646, Jul. 23, 1979, abandoned. This application Jun. 7, 1982, Ser. No. 385,497

Int. Cl.³ H04M *3/42, 7/06*

U.S. Cl. 179—18 B **5 Claims**



1. A method for delivering an audio intercept message at a call originating location in response to an intercept signal returned from a call terminating location, comprising the steps of:

recognizing an intercept condition occurring at the terminating location, in response to a call originated by a calling party at the originating location;

producing at said terminating location an intercept message control signal which corresponds to a desired audio intercept message;

returning said intercept message control signal from said terminating location to said originating location;

originating a selected audio intercept message at said originating location for delivery to the calling party at said originating location, in response to said intercept message control signal returned from said terminating location;

producing at the originating location an acknowledgement signal in response to said intercept message control signal and forwarding said acknowledgement signal to the terminating location, if and only if the originating location is capable of originating said audio intercept message in response to said intercept message control signal; and

originating an audio intercept message at the terminating location for audio transmission to the calling party at the originating location, if said acknowledgement signal is not received at the terminating location within a predetermined time after the intercept message control signal was returned to the originating location.

4,446,338

TELEPHONE LINES STATUS SENSOR

Reinhard W. Rosch, Richmond, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 12, 1982, Ser. No. 397,567

Int. Cl.³ H04Q *5/20*

U.S. Cl. 179—18 FA **14 Claims**

1. A line status sensor for use in a telephone station apparatus including a pair of line terminals for connection to tip and ring leads of a telephone line, the line status sensor comprising:

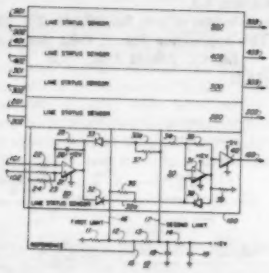
first and second power terminals for connection across a power source;

first means being connected across the first and second power terminals, for generating a reference voltage, and first and second limit voltages of negative and positive polarities respectively in relation to the reference voltage;

a translation circuit being responsive to forward and reverse potential differences appearing across the line terminals and to the reference voltage, for generating voltage signals of corresponding polarity in relation to the reference voltage;

a detection circuit for generating an output signal being of

one binary state in response to the voltage signal being outside of a range defined in relation to the first and second limit voltages, and for generating the output signal



being of another binary state in response to the voltage signal being within said defined range, whereby said output signal is indicative of conditions of the telephone line.

4,446,339

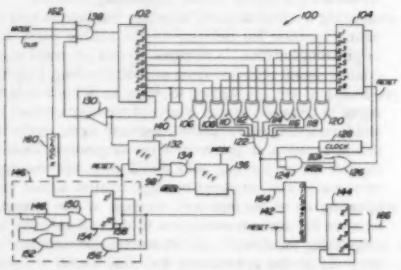
ROTARY DIAL DECODER

Duane R. Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Bala Cynwyd, Pa.

Filed Apr. 26, 1982, Ser. No. 371,808

Int. Cl.³ H04M *3/38*

U.S. Cl. 179—84 R **6 Claims**



1. In a rotary dial actuated telephone system, means for detecting frequency transients produced by the rotation of a telephone dial, means for determining a fixed time period for passage of said transients from the dial to a telephone receiver network, means for counting the quantity of said transients passing to said receiver network within said fixed time period, means for translating the quantity of transients passed to said receiver network within said time period into an actuating signal, and generating means to utilize said actuating signal to generate a desired function.

4,446,340

CUSTOMER PREMISES LOOP TEST UNIT POWERED FROM THE NORMAL CENTRAL OFFICE POWER SOURCE

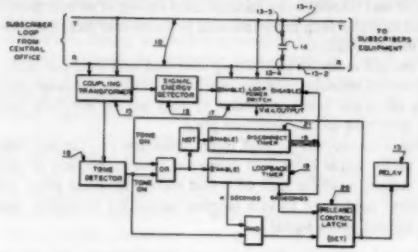
Warren R. Fryer, New York, N.Y., assignor to Calculagraph Company, East Hanover, N.J.

Filed Apr. 23, 1982, Ser. No. 371,080

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 R **4 Claims**

1. A telephone line loopback circuit for use in testing the line between the central office and a subscriber's equipment, which circuit is located at the subscriber's end of the line and adapted to be powered solely by the normal central office power supply, means normally maintaining the circuit disconnected from the office power supply, and means connecting the circuit to



the office power supply as a result of receiving an a.c. signal transmitted over the telephone line.

4,446,341

MECHANIZED TESTING OF SUBSCRIBER FACILITIES

Harvey Rubin, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

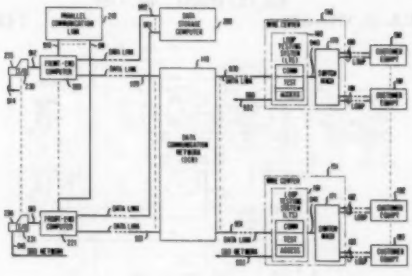
Filed Jul. 16, 1982, Ser. No. 399,177

Int. Cl.³ H04M *3/26*

U.S. Cl. 179—175.2 R **10 Claims**

MICROFICHE APPENDIX INCLUDED

(89 Microfiche, 5358 Pages)



1. In combination with a wire center (**150**) having test trunk means (**940,170**) for connecting to subscriber loops (**180,181**) and associated equipment (**190,191**) served by said wire center, a system for accessing said loops and said equipment comprising

processor means (**200,210,220,221**) having an interface (**230** or **231**) for receiving information (INFORMATION fields) provided by a system user,

controller means (**160**), collocated with said wire center, including means (**2600,2650,2700,2801–2816,2950**) for accessing one of said loops through said test trunk means as determined by said information, and

means (**920,921,140,930**) for transmitting said information from said processor means to said controller means,

said interface including circuitry (**235,236**) for establishing a communication path over the national dial network (**914,915**) terminating at said interface, and

said controller means including means (**2301–2306,2400**) for calling said circuitry over the national dial network (**932**) originating from said wire center based on said information and means (**2700**) for connecting said one of said loops to said communication path, thereby providing a connection for interactive communication.

4,446,342

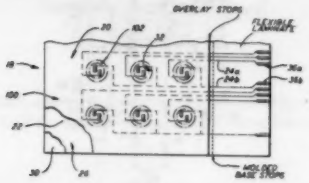
ELECTRICAL SWITCH ASSEMBLY AND METHOD OF MANUFACTURE

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Nashua, N.H.

Continuation-in-part of Ser. No. 216,162, Dec. 15, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 290,220

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 R **12 Claims**



1. An electrical switch assembly comprising in combination:

a dielectric carrier panel having at least one cavity formed in one face of said panel;

an electrically conductive circuit formed of a resiliently flexible conductive material fixed in part to said dielectric carrier panel, said electrically conductive circuit having an array of switch means, each of said switch means comprising a pair of contact members overlying said cavity, said pair of contact members comprising (a) integral extensions of such said conductive circuits and including (b) a pair of generally L-shaped fingers (1) disposed inwardly for a distance and (2) cantilevered from the edge of their associated cavity, said L-shaped fingers occupying the same plane adjacent the edge of their associated cavity, extending beyond the geometric center of said associated cavity, and extending, in part, above or below the plane of said one face; and

actuating means overlaying said contacts members.

4,446,343

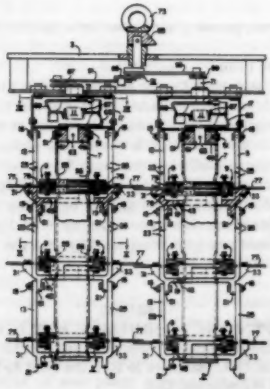
SWITCH MECHANISM FOR TRANSFORMER

Gregory J. Golub, and Albert M. Jenkins, both of Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 14, 1982, Ser. No. 417,964

Int. Cl.³ H01H *3/00, 19/00, 21/00*

U.S. Cl. 200—11 TC **4 Claims**



1. A switching device between two electrical supply lines for use with electrical inductive apparatus, comprising:

a tank having a side wall for containing electrical inductive apparatus;

a pair of open-close switches mounted on the side wall and electrically connected to said apparatus to provide three- and four-position switching;

each switch having an operating shaft, a movable contact structure on the shaft, and spaced stationary contact structures disposed on the switch for simultaneous open-close switching;

the operating shafts having separate shaft portions;

an operating handle external of the tank and connected to the separate shaft portions;

linkage means coupled between the operating shaft portions and the handle to provide

(a) four-position switching including

(1) transformer closed through both switches,

(2) transformer closed through the one switch,

(3) transformer closed through the other switch,

(4) transformer open through both switches, or

(b) three-position switching including transformer grounded, closed, or open, when one of the electrical supply lines is grounded;

means for connecting the operating handle to the linkage means and include a crank shaft extending through the side wall;

a crank arm fixedly mounted on the crank shaft;

a crank link fixedly mounted on the crank arm;

a rocker arm mounted on each operating shaft portion;

and a connecting link connected between the crank arm and each of the rocker arms.

4,446,344

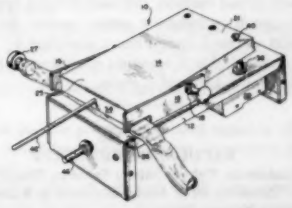
PRESSURE OPERATED SWITCH INCLUDING AN EXPANDABLE FLAT TUBE

Armin Fiedler, Chicago, Ill., assignor to International Freezer Corp., Chicago, Ill.

Continuation of Ser. No. 123,198, Feb. 21, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,755

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 B **10 Claims**



6. A pressure operated device for providing an output signal in response to a predetermined pressure condition, said device comprising:

a tube having a segment of deformable material adapted to communicate with a source of varying pressure;

housing means;

a switch supported by the housing means;

said housing means defining a supporting surface for said tube;

a movable member supported by said housing means;

means releasably retaining said tube segment between said supporting surface and said movable member;

said movable member being coupled to said switch for operating the switch to provide an output signal in response to tube segment deformation resulting from the predetermined pressure condition;

and the improvement characterized by;

said tube segment lying between said supporting surface and said movable member being flat on at least an entire elon-

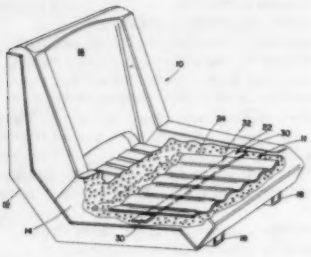
gated surface of said tube segment in contact with said movable member when said tube is in an unpressurized condition.

4,446,345

SEAT SWITCH ASSEMBLY

William G. Sheiry, Roanoke, Va., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 19, 1982, Ser. No. 379,593
Int. Cl.³ H01H *3/02*
U.S. Cl. 200—85 R **4 Claims**



1. In combination with a seat comprising a frame and a bottom cushion supported by said frame, a switch assembly including a ribbon switch disposed horizontally across said bottom cushion, the improvement wherein said switch assembly includes a substantially rigid actuating member disposed above said ribbon switch and substantially coextensive with the length of said ribbon switch in a direction parallel to the length of said ribbon switch and of substantially greater length than the width of said ribbon switch in a direction across said ribbon switch, said actuating member having a plurality of spaced apart contact areas extending across and engageable with said ribbon switch, said actuating member having a projected surface area which is only slightly smaller than the surface area of said cushion, said switch being connected in an electrical circuit including a power source and a warning device, said warning device being activated by actuation of said ribbon switch due to a weight equivalent to the weight of an operator applied to said cushion.

4,446,346

VACUUM INTERRUPTER

Yutaka Kashimoto, Tokyo; Shinzo Sakuma, Kanagawa, and Eiji Umeya, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

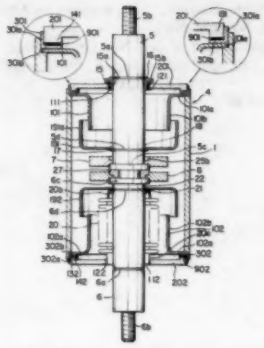
Filed Oct. 9, 1981, Ser. No. 310,397
Claims priority, application Japan, Oct. 21, 1980, 55-150277[U]
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**

1. A vacuum interrupter comprising:

(a) a pair of fixed and movable electrode rods, each of said electrode rods being formed with a flange portion at one end thereof;

(b) a pair of fixed and movable electrodes of the magnetic arc driving type, each of said electrodes being formed with a central hole and two annular equal-depth recessed fitting portions on the upper and lower surfaces thereof, said flange portion of each of said fixed and movable electrode rods being fitted to one of said two central recessed fitting portions of each of said fixed and movable electrodes, respectively; and

(c) a contact member formed with a flange portion fitted to the other of said two annular recessed fitting portions of one of said two electrodes in such a way that the flange portion of the electrode rod fixed to the other electrode



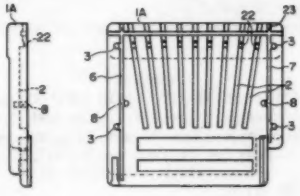
can be brought into contact with or separated from said contact member for current interruption.

4,446,347

ARC-SUPPRESSING APPARATUS FOR CIRCUIT BREAKER

Kiyoshi Eguchi; Takayoshi Ishikawa; Shigemi Tamaru; Yasushi Genba, and Toshihiko Kodera, all of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,939
Claims priority, application Japan, Apr. 6, 1981, 56-51064[U]
Int. Cl.³ H01N *33/08, 9/34*
U.S. Cl. 200—144 R **8 Claims**



1. An arc-suppressing apparatus for a circuit breaker, comprising:

at least one grid;

a pair of plates, each having at least one first groove located at a predetermined position and at least one second groove extending linearly from one end of said at least one first groove to an edge of each of said side plates, said second groove being shallower than said first groove;

said at least one grid having opposite side edges insertable into said at least one first groove by sliding said opposite side edges along said second groove on said pair of plates, said at least one grid being held by said pair of plates.

4,446,348

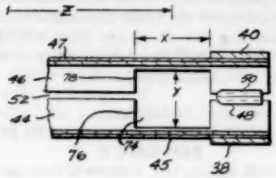
SERPENTINE MICROWAVE APPLICATOR

Hua-Feng Huang, Chadds Ford, Pa., and Walter A. Wallace, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1982, Ser. No. 363,282
Int. Cl.³ H05B *9/06*
U.S. Cl. 219—10.55 A **9 Claims**

1. In a serpentine microwave applicator having a plurality of

slotted waveguides and rectangular apertures between the waveguides for coupling them, the improvement comprising



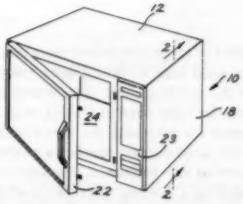
providing each aperture with a width greater than its depth and at least half the guided wavelength of the applied energy.

4,446,349

MICROWAVE PHASE SHIFTING DEVICE

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1983, Ser. No. 454,962
Int. Cl.³ H05B 6/74
U.S. Cl. 219—10.55 F **18 Claims**



1. Apparatus for shifting the phase of microwave energy propagating in a hollow waveguide of generally rectangular cross-section comprising a pair of opposed parallel broad walls, joined by a pair of opposed parallel narrow walls, configured to support a predetermined microwave energy propagation mode therein and adapted at one end thereof to receive microwave energy from an external source to establish an electric field in the waveguide characterized by a standing wave field pattern, said apparatus comprising:

a septum formed in the waveguide remote from the one end thereof and extending parallel to the narrow walls and electrically connecting the broad walls, thereby dividing the waveguide into two sub-waveguides, the resultant width of each sub-waveguide being insufficient to support the predetermined propagating mode, said septum having a leading edge disposed toward the one end of the waveguide and defining a short circuit termination for the waveguide;

a pair of dielectric plugs, each mounted in a respective one of said sub-waveguides, for tandem longitudinal movement relative to said leading edge, the phase of the standing wave varying substantially linearly with forward displacement of said plugs toward the one end of the waveguide relative to said leading edge; and

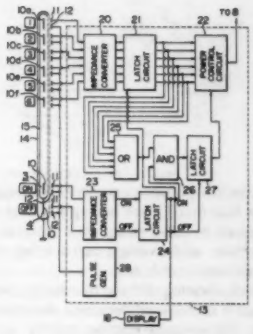
means for moving said plugs relative to said leading edge to shift the phase of the standing wave field pattern in the waveguide.

4,446,350

INDUCTION HEATING COOKING APPARATUS

Takumi Mizukawa, Neyagawa; Keizo Amagami, Takatsuki, and Yoshio Ogino, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 9, 1981, Ser. No. 272,032
Claims priority, application Japan, Jun. 17, 1980, 55-82613
Int. Cl.³ H05B 6/12; G08C 9/02
U.S. Cl. 219—10.77 **4 Claims**



1. An induction heating cooking apparatus comprising

a flat pan supporting plate made of a heat-resistant dielectric material for supporting a pan thereon, said plate having upper and lower surfaces;

a heating coil for induction heating of said pan, said heating coil being positioned under said pan supporting plate;

a power source for supplying a high frequency current to said heating coil;

a first touch pad for producing a first signal to effect turning on of said power source upon being touched with a finger;

a second touch pad for producing a second signal to effect turning off of said power source upon being touched with a finger;

a third touch pad for producing a third signal to effect setting of a power level of said power source to a predetermined level;

each of said first, second and third touch pads constituting a capacitor-pair formed by a first electrode attached to the upper surface of said pan supporting plate and second and third electrodes respectively mounted on the lower surface of said pan supporting plate, the capacitance of the capacitor-pair being varied when the first electrode is touched;

a control circuit connected to said first, second and third touch pads and said power source for controlling the supply of said high frequency current from said power source in response to said first, second and third signals from said first, second and third touch pads;

a first guard ring made of a conductive material formed on the upper surface of said pan supporting plate enclosing said first electrodes of said first, second and third touch pads, said first guard ring being connected to said first electrode of said second touch pad; and

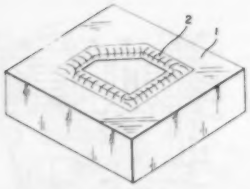
a second guard ring made of a conductive material formed on the upper surface of said pan supporting plate enclosing said first guard ring, said second guard ring being grounded.

4,446,351

PROCESS FOR PREPARING A PRESS DIE

Kenji Kawaguchi; Osamu Hamada; Seigo Hiramoto, all of Amagasaki; Yukio Kato, and Kozo Yamada, both of Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 326,163
Claims priority, application Japan, Feb. 27, 1981, 56-28891; Apr. 7, 1981, 56-52029
Int. Cl.³ B23P 1/00; B21K 5/20
U.S. Cl. 219—69 W 8 Claims



1. A process for preparing a press die, comprising:
forming a base metal piece having first and second surfaces;
overlaying an overlaid metal on a selected portion of said first surface, said overlaid metal being different in kind from said base metal; and
subsequently forming said die by cutting said base and overlaid metals into a predetermined shape in a single operation at said selected portion and by use of a wire cut electric discharging process, to form a die edge extending from said first surface towards said second surface.

4,446,352

FILTER LEAF

Theodore H. O'Cheskey, and Hugh T. Edwards, Jr., both of Whittier, Calif., assignors to United States Filter Fluid Systems Corp., Whittier, Calif.

Continuation of Ser. No. 177,265, Aug. 11, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,670
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LC 15 Claims

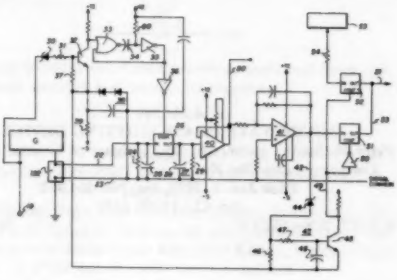
1. A filter leaf comprising:
a closed frame having an inner periphery defining an open space within the frame and an outer periphery, a first flat side surface extending between the peripheries, and a second flat side surface extending between the peripheries;
a first screen covering the open space such that the outer periphery of the first screen overlaps and abuts the first side surface of the frame;
a first bead made of the same material as the first screen bonding the edge of the first screen to the first side surface of the frame, the first bead having a flange extending into the frame from the edge of the first screen toward the inner periphery of the frame;
a second screen covering the open space such that the outer periphery of the second screen overlaps and abuts the second side surface of the frame; and
a second bead made of the same material as the second screen bonding the edge of the second screen to the second side surface of the frame the second bead having a flange extending into the frame from the edge of the second screen toward the inner periphery of the frame.

4,446,353

CENTER TRACKING WELDER UNIT WITH FLOATING REFERENCE

Talbert D. Connell, Spring, Tex., assignor to Crutcher Resources Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 114,828, Jan. 24, 1980, abandoned. This application May 7, 1982, Ser. No. 375,974
Int. Cl.³ B23K 9/12
U.S. Cl. 219—125.12 11 Claims



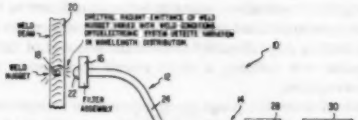
1. In the method of controlling movement of a welding torch device along a weld line in consumable electrode type arc welding where the welding torch is to weave along the weld line and wherein the weld current is integrated and compared against a reference for reversing the weaving direction when the integral of the weld current reaches a predetermined relation with respect to the reference, the improvement which comprises generating a floating reference voltage in response to the low frequency components of said weld current and reversing the direction of travel of the arc when said integral bears said predetermined relation to said floating reference voltage.

4,446,354

OPTOELECTRONIC WELD EVALUATION SYSTEM

Frank W. Kearney, Champaign, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 29, 1981, Ser. No. 268,224
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.01 5 Claims



1. A weld quality sensing system for monitoring a weld bead, comprising:
(a) a first fiber optic light pipe, having first and second ends,

disposed to receive radiation emitted from the weld bead at said first end;

(b) first photodetector means disposed at said second end of said fiber optic light pipe for generating an electrical signal in accordance with the spectral band amplitudes of said radiation;

(c) first means for driving said first photodetector means with a continuous bias sweep signal thereby controlling the received radiation; and

(d) first means for comparing said electrical signal with a reference value.

4,446,355

CROSSOVER CONSTRUCTION OF THERMAL-HEAD AND METHOD OF MANUFACTURING SAME

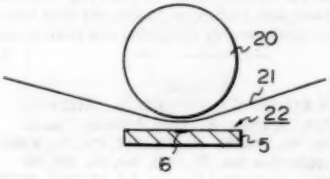
Kiyoshi Sato; Minoru Terashima, both of Kawasaki; Haruo Sorimachi, Yokohama; Toshiaki Naka, Machida; Takeo Kanno, Suzaka, and Fumiaki Yamada, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

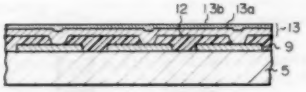
Filed Feb. 22, 1982, Ser. No. 351,284

Claims priority, application Japan, Feb. 23, 1981, 56-24212

Int. Cl.³ H05B *3/00*; G01D *15/10*; B41J *3/20*

U.S. Cl. 219—216 **10 Claims**





1. A crossover construction of a thermal-head in which the thermal-head comprises:

(a) a substrate of insulating material;

(b) a plurality of heat elements disposed side by side in one row on said substrate;

(c) a plurality of lower thin film conductor patterns, each of which connects to each of said heat elements and extends in direction X;

(d) an insulating layer disposed over said lower conductors;

(e) plurality of upper conductor patterns disposed in parallel in another direction Y on said insulating layer so as to form a crossover on said substrate, wherein said upper and lower conductors are selectively connected together through openings of said insulating layer, and wherein said insulating layer and said upper conductors comprise printed and cured paste of insulating material and conductive material, respectively, each paste being of the low temperature curing type which can be cured at a temperature low enough not to affect the resistance of said thin film lower conductors; and

(f) a metallic layer of low resistance coated on each of said upper conductors.

4,446,356

ELECTRIC SAUNA HEATER

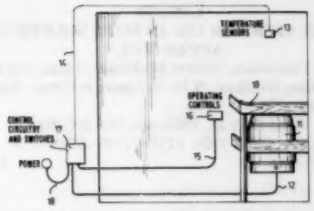
Pentti I. Rimmi, Hanko, Finland, assignor to Oy Helo Tehtaat, Hanko, Finland

Filed Aug. 25, 1981, Ser. No. 296,160

Claims priority, application Finland, Sep. 12, 1980, 802863

Int. Cl.³ A61H *33/06*; F24H *9/20*; G05B *1/02*

U.S. Cl. 219—272 **10 Claims**



1. An electric sauna heater comprising:

a heater unit adapted to be disposed in a sauna room and including heating elements;

switching means coupled to said heating elements for connecting power to said heating elements;

controlling means coupled to said switching means for controlling operation of said switching means, said controlling means including circuitry operable at a low voltage relative to the voltage of the power connected to the heating elements;

operating controls for the sauna heater coupled to said circuitry operable at a low voltage of said controlling means, said operating controls being disposed as a separate unit from said switching means, said controlling means and said heater unit so that a low voltage is present at said separate unit for said operating controls; and

means for coupling said operating controls and said controlling means.

4,446,357

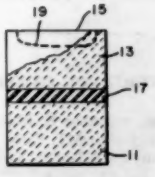
RESISTANCE-HEATED BOAT FOR METAL VAPORIZATION

Dennis W. Barshter, Grand Island, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 30, 1981, Ser. No. 316,464

Int. Cl.³ C23C *13/12*

U.S. Cl. 219—275 **9 Claims**



1. A resistance-heated boat comprised of:

(a) an elongated heating portion comprised of a material selected from the group of refractory metal carbides, borides, nitrides, silicides, oxides and mixtures thereof.

(b) an elongated crucible portion comprised of a material selected from the group of refractory metal carbides, borides, nitrides, silicides, oxides, and mixtures thereof, said heating portion being substantially coextensive with said crucible portion.

(c) a heat conducting, substantially non-electrical conduct-

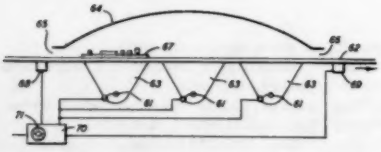
ing portion having a thermal conductivity between about 0.008 and about 0.500 cal-cm^2/sec/(°C./cm) and an electrical resistivity greater than 10^3 ohm-cm, said heat conducting portion being substantially coextensive with said crucible portion and being disposed between and in coextensive contact with said crucible portion and heater portion to form a high heat conductivity bridge therebetween.

4,446,358

PREHEATER FOR USE IN MASS SOLDERING APPARATUS

Matthias F. Comerford, Newton Highlands, Mass., and Michael G. McCallan, Windham, N.H., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 15, 1981, Ser. No. 330,909
Int. Cl.[3] **F27B** *9/06*; **F27D** *11/00*; **B23K** *1/20*
U.S. Cl. 219—388 **6 Claims**



1. A preheater for a mass soldering apparatus comprising a plurality of rapid heat-up heaters, a parabolic reflector for directing the output from each heater toward a printed circuit board conveyor path and a detector responsive to a circuit board entering the preheater to turn on said heaters, the reflectors being directed to provide a substantially uniform distribution of heat from the heaters over a desired area of said circuit board conveyor path, said parabolic reflectors being arranged to direct heat from the heaters upwardly from underneath said circuit board conveyor path and a reflective cover being disposed over said desired area of the circuit board conveyor path to be heated, to reflect heat energy, passing through the conveyor path from the heaters, back toward the conveyor path, the heaters being quartz lamps of elongate cylindrical form disposed horizontally in parallel spaced relationship, the reflectors being disposed in parallel spaced apart relationship and said reflective cover defining a part cylindrical reflector having a longitudinal axis parallel to the cylindrical axis of said lamps, said quartz lamps having a response time to 90% of maximum heat of less than 5 seconds and further means arranged to detect or predict passage of a circuit board from the preheater and connected, in response to such passage, to turn off said heaters.

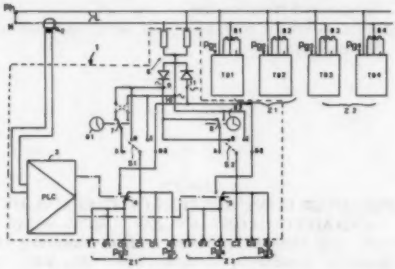
4,446,359

PEAK LOAD CONTROL FOR AN ELECTRIC HEATING SYSTEM

Cecilio Arribas, Laon, and Rene E. Blassiau, Nevers, both of France, assignors to Noirot-MT, Paris, France

Filed Nov. 24, 1981, Ser. No. 324,451
Int. Cl.[3] **H05B** *1/02*
U.S. Cl. 219—485 **4 Claims**

1. A peak load control apparatus for use with an electric heating system comprising a plurality of electric heating units, said peak load control apparatus comprising detection means for detecting current to a feeder line for the electric heating units and providing a signal proportional to the current in the feeder line, a peak load trigger means connected to said detection means for delivering a signal when the signal provided by said detection means exceeds a predetermined adjustable value, first time control means comprising a flip-flop interposed between said peak load trigger means and a selected first group of the electric heating units for a predetermined adjustable period, second time control means comprising another flip-flop interposed between said peak load trigger means and a selected second group of electric heating units for cutting off power to the second group of electric heating units for a predetermined adjustable period substantially at the end of the predetermined period during which power to the first group of electric heating units is cut off, relay means for controlling each group of



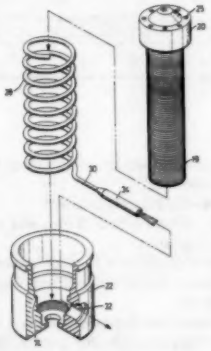
electric heating units energized from one of said time control means and actuating a switch arranged in pilot circuits of each of said groups of electric heating units, and an enabling circuit for simultaneously cutting off power to the first and second groups of electric heating units, said enabling circuit being connected to said peak load trigger means and third time control means for simultaneously energizing said relay means.

4,446,360

SPRUE BUSHING CONNECTOR ASSEMBLY

Jobst U. Gellert, 7A Prince St., Glen Williams, Canada

Division of Ser. No. 285,260, Jul. 20, 1981, Pat. No. 4,403,405.
This application Jun. 27, 1983, Ser. No. 508,080
Claims priority, application Canada, Jul. 15, 1981, 381799
Int. Cl.[3] **F27B** *14/06*
U.S. Cl. 219—421 **4 Claims**



1. In an integral electrically heated sprue bushing having a hollow elongated inner core portion with a runner passage extending centrally therethrough, an electrical heating element with a helical portion encircling the inner core portion and a lead portion having an enlarged end portion, the lead portion extending out through an aperture in the sprue bushing which is considerably larger than the heating element lead portion, a highly conductive elongated portion around the helical portion of the heating element, and an elongated outer sleeve portion over the conductive portion, the improvement further comprising:

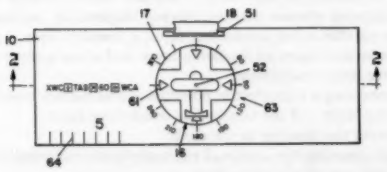
(a) the aperture having seat means therein,
(b) first split washer means with a central opening through which the heating element lead portion extends formed by fitting a first plurality of split washer portions in the seat means in the aperture around the heating element lead portion thereby substantially closing the space therearound,
(c) second split washer means similar to the first split washer means formed adjacent thereto by fitting a second plurality of split washer portions in the seat means in the aperture around the heating element lead portion, and
(d) a hollow elongated connector sleeve rigidly fixed to the sprue bushing with one end received in the aperture adjacent the second split washer means, with the heating element lead portion extending therein for connection to external lead wires.

4,446,361

AIRCRAFT FLIGHT COMPUTER

Steven R. Riggin, 5315 E. Countryside, Wichita, Kans. 67218

Filed Jun. 11, 1979, Ser. No. 47,145
Int. Cl.[3] G06C *27/00*
U.S. Cl. 235—78 N **3 Claims**



1. A laminated aircraft flight computer for use by aircraft pilots to plot courses, determine the effect of wind on the aircraft, determine headings for radio navigation, determine traffic pattern headings, and holding pattern headings assigned by the air traffic controller comprising:

A first structural member having a first substantially cylindrical opening, a planer bottom said opening having an axis of symmetry;

A second structural member fastened to said first structural member having a second substantially circular cylindrical opening coaxial with said first opening, said opening being larger than said first opening;

A first circular disk member having a radius substantially equal to the radius of said first opening for rotatable movement therein;

A second rotatable circular member having a radius substantially equal to the radius of said second opening, said second rotatable member positioned in said second opening substantially coaxial with said first rotatable member and overlaying the body thereof, said rotatable member adapted to permit access to said first rotatable member and is transparent;

A backplate member ridgidly attached to at least said first structural member, and preventing downward axial movement of said first rotatable member;

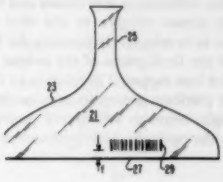
A retainer member rigidly attached to at least said second structural member, having a third circular opening therein for viewing predetermined indicia means imprinted on said first and second rotatable members; and said retainer member and said second structural member forming lip means for axially retaining said first and second rotatable members in their respective openings.

4,446,362

WORKPIECE WITH ABRADED MACHINE-READABLE MARKING THEREIN AND METHOD OF MAKING

Philip M. Heyman, Robbinsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1979, Ser. No. 41,092
Int. Cl.[3] G06K *7/10*
U.S. Cl. 235—462 **5 Claims**



1. A method for producing a machine-readable coded marking in a surface of a rigid workpiece, said marking comprising a related sequence of substantially parallel bars of at least two different widths separated by substantially parallel spacings comprising

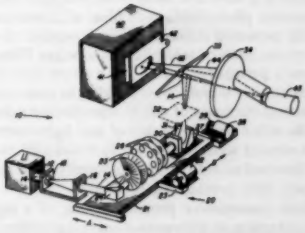
(a) providing means for abrading a single defined strip-like area of said surface, said defined area having about the width of the smaller of said two different widths of said bars,
(b) moving said abrading means along a particular substantially linear path with respect to said surface in the direction of the width of said defined area so as to selectively target a succession of contiguous defined areas of said surface,
(c) and, during step (b), either activating said abrading means to abrade at one time the entire targetted defined area of said surface or deactivating said abrading means to not abrade any part of said targetted defined surface area according to a prearranged program.

4,446,363

TARGET FOR OPTICALLY ACTIVATED SEEKERS AND TRACKERS

Charles T. Lakin, Fredericksburg, and Norman F. Willett, Colonial Beach, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1982, Ser. No. 353,682
Int. Cl.[3] G01J *1/20*
U.S. Cl. 250—203 R **14 Claims**



1. A simulated target for a weapon having an optically activated seeker, comprising:

light source means generating a target light beam;

adjustable means for varying the cross-sectional area of the target light beam;

lens means for collimating the adjusted target light beam;

first movable platform means provided with means for di-

recting the collimated target light beam in a direction toward a second movable platform means;

the second movable platform means movably mounted on the first platform means, the second movable platform means being comprised of an output lens for focusing the directed and collimated target light beam at a position in the focal plane of the output lens;

means for selectively moving the first platform means relative to the collimating lens means and the second movable platform means relative to the first movable platform means so as to selectively position the focused target light beam on the focal plane of the output lens; and

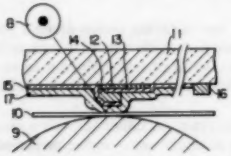
an objective lens mounted in relation to the first and second movable platform means so as to project an image of the target light beam as selectively positioned on the focal plane to the optically activated seeker.

4,446,364

PHOTOELECTRIC CONVERTER ON A TRANSMISSIVE SUBSTRATE HAVING LIGHT SHIELDING

Seiichi Hayashi, and Eiichi Hara, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1981, Ser. No. 247,262
Claims priority, application Japan, Mar. 26, 1980, 55-37482
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 R **2 Claims**



1. A photoelectric converter device comprising:

a light transmissive substrate;

an elongated stripe-like light intercepting film formed on one surface of said light transmissive substrate;

a light source disposed on an opposite side of said light transmissive substrate relative to said light intercepting film;

a group of separated first electrodes, each of said first electrodes extending across the light intercepting film in a manner covering more than half of said light intercepting film in the width direction thereof and continuing from a longitudinally extending edge of said light intercepting film in a direction away from said light intercepting film;

separated photoconductive films of a semiconductor material provided corresponding in number to said first electrodes, each of said photoconductive films being formed on a peripheral portion of a respective one of the first electrodes which covers said light intercepting film;

a second electrode of a light transmissive material formed at the other widthwise side of said light intercepting film in a manner so as to commonly cover said photoconductive films and so as to extend outwardly from said other side of said light intercepting film; and

a light transmissive protection film, of a type suitable for contacting an information carrying surface in use, formed on said first and second electrodes so as to cover them;

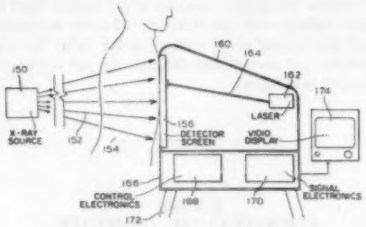
whereby, in use, light from said light source will reach an information carrying surface disposed in contact with said light transmissive substrate through said light transmissive substrate, said second electrode and said light transmissive protection film, and light reflected from said information carrying surface will reach said photoconductive films through said light transmissive protection film and said second electrode.

4,446,365

ELECTROSTATIC IMAGING METHOD

Poen S. Ong; Alfonso Zermeno; Lee M. Marsh, Jr., all of Houston, Tex., and James M. Hevezi, Tuscon, S. Dak., assignors to University of Texas System, Austin, Tex.

Division of Ser. No. 22,989, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 781,165, Mar. 25, 1977, abandoned. This application Jul. 6, 1981, Ser. No. 280,401
Int. Cl.³ H01J *31/50*
U.S. Cl. 250—213 R **3 Claims**



1. A method of impressing a uniform surface charge on a multilayered photon detector having sequentially stacked in plane parallel a first conducting layer, a junction layer, a photoconductive layer, an insulating layer, and a transparent conductive layer comprising:

connecting a high electric potential across the first conducting layer and the transparent conductive layer;

storing the detector in the dark;

disconnecting the source of external electric potential while said detector is in the dark;

electrically connecting said first conducting layer to said transparent conducting layer while said detector is in the dark; and

reapplying the potential with reversed polarity between said first conducting layer and said transparent conducting layer while said detector is in the dark.

4,446,366

FIBER OPTIC MEASURING DEVICE WITH COMPENSATION FOR REFLECTIONS IN THE FIBER OPTIC AND WITH A POSSIBILITY OF SIMULTANEOUS MEASUREMENT OF SEVERAL QUANTITIES

Torgny Brogardh; Christer Ovren, and Lars Sander, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 28, 1981, Ser. No. 306,350
Claims priority, application Sweden, Sep. 30, 1980, 8006827
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **15 Claims**

1. A fiber optic measuring device for measuring physical and chemical quantities, comprising:

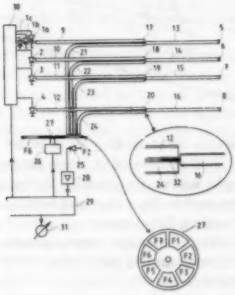
at least one measuring transducer adapted to influence the spectral composition of incident light such that emitted light from the measuring transducer includes a spectrum having at least one wavelength interval different than

another wavelength interval of the incident light, said measuring transducer including a material having an optical absorption edge within at least one wavelength interval coinciding with the spectrum of said emitted light such that the dependence of the response spectrum of the emitted light on the measured quantity induces wavelength displacement of said absorption edge;

an evaluating electronic unit including at east one source of said incident light;

at least one light conducting fiber interconnecting said measuring transducer and said evaluating electronic unit for transmitting said incident light from said at least one source to said measuring transducer and emitted light from said measuring transducer to said evaluating electronic unit;

said evaluating electronic unit further including at least one photo-detector and an optical coupling device for coupling said incident light into said at least one



light conducting fiber and for coupling light from said at least one light conducting fiber to said photo-detector;

an optical filter means positioned in the light ray path between said at east one light conducting fiber and said photo-detector for analyzing the emitted light spectrum from said at least one measuring transducer, said optical filter means having filtering spectra dividing the emitted spectrum from said measuring transducer into at least three non-identical wavelength intervals;

said photo-detector being adapted to measure the emitted light to measure the filtered emitted light from said optical filter means and generating detector signals in the respective wavelength intervals; and

said evaluating unit further including means for multiplying the detector signals by constants including the constant unity, means for forming the difference between said detector signals multiplied by said constants, and means for forming the quotient therebetween.

4,446,367

PULSE-PRODUCING TRANSDUCER

Alfred Babsch, Ulm-Söflingen, and Gerhard Lohrmann, Elchingen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,839

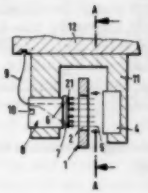
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014821

Int. Cl.³ G01D *5/38*

U.S. Cl. 250—231 SE **10 Claims**

1. A transducer station which includes an optical grating and a support member, the grating and the member being movable relative to each other along the direction of extension of the grating, there being a source of radiation on the member, the grating having a disposition so that the source illuminates the grating, permitting optical pickup, the station further comprising:

means associated with the support member for defining a bore of rotational symmetric contour;



a carrier member rotatably disposed in said bore and having a front face;

a pair of detectors disposed on the front face, the bore and the carrier member being oriented so that the detectors of the pair can be aligned in directions transverse to said direction of extension; and

means defining a screwdriver slot and provided for permitting turning of the carrier member to affect aligning of the detectors.

4,446,368

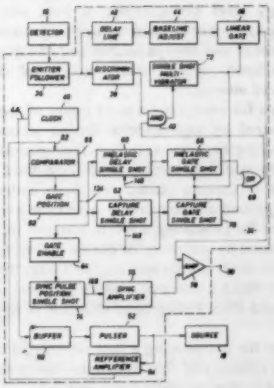
METHOD AND APPARATUS FOR NEUTRON INDUCED GAMMA RAY WELL LOGGING

Lawrence D. Koenn, and David B. Drude, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 3, 1981, Ser. No. 326,862

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—262 **28 Claims**



1. A method for logging formations surrounding a borehole, comprising the steps of:

irradiating said formations with a first series of bursts of high energy neutrons;

detecting radiation emanating from said formations during said first series of bursts of neutrons;

irradiating said formations with a second series of bursts of high energy neutrons; and

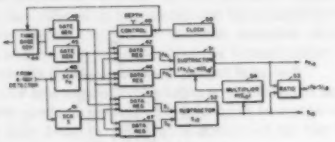
detecting radiation emanating from said formations subsequent to said second series of bursts of neutrons.

4,446,369

METHOD AND SYSTEM FOR RADIOACTIVE ASSAYING

Wyatt W. Givens, and Linus S. Allen, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,022
Int. Cl.³ G01V *5/10*
U.S. Cl. 250—270 **2 Claims**



1. A system for assaying a formation traversed by a borehole for pyrite comprising:

a. a borehole tool,

b. means for locating said borehole tool adjacent a zone of interest within said formation,

c. a neutron source located within said borehole tool for irradiating said zone of interest with bursts of neutrons of energy sufficient to produce gamma-rays from inelastic neutron scattering in sulfur and iron,

d. a gamma-ray detector located within said borehole tool for measuring gamma-rays returning to the borehole in response to irradiation of said zone of interest by said bursts of neutrons from said neutron source,

e. means for producing a first count of those gamma-rays measured by said detector during first time periods coinciding with the time periods of said bursts of neutrons from said source and which occur within a first energy band surrounding an energy level characteristic of sulfur, said first count being a count of inelastic scattering gamma-rays from sulfur present in said zone of interest and of capture gamma-rays from hydrogen and other background elements in said zone of interest,

f. means for producing a second count of those gamma-rays measured by said detector during said first time periods which occur within a second energy band surrounding an energy level characteristic of iron, said second count being a count of inelastic scattering gamma-rays from iron present in said zone of interest and of capture gamma-rays from hydrogen and other background elements in said zone of interest,

g. means for producing a third count of those gamma-rays measured by said detector during second time periods occurring between said first time periods which occur within said first energy band, said third count being a count of capture gamma-rays from hydrogen and other background element in said zone of interest,

h. means for producing a fourth count of those gamma-rays measured by said detector during said second time periods which occur within said second energy band, said fourth count being a count of capture gamma-rays from hydrogen and other background elements in said zone of interest,

i. means for determining a first differential in said first and third counts, said first differential being representative of sulfur present in said zone in interest,

j. means for determining a second differential in said second and fourth counts, said second differential being representative of iron present in said zone of interest,

k. means for determining a third differential of a multiple of said first differential representing the higher energy level of gamma-rays from sulfur and said second differential representing the lower energy level gamma-rays from iron, and

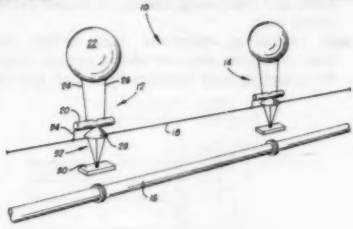
l. means for determining the ratio of said first and third differentials, said ratio being representative of the presence of pyrite in the formation, whereby an increase in said ratio during logging operations is indicative of excess iron in the form of an iron-bearing compound other than pyrite and a decrease in said ratio is indicative of excess sulfur in the form of a sulfur-bearing compound other than pyrite.

4,446,370

APPARATUS FOR DETECTING OIL IN WATER

John S. Gergely, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 28, 1981, Ser. No. 334,596
Int. Cl.³ G08B *21/00, 1/08*
U.S. Cl. 250—301 **12 Claims**



1. An apparatus for detecting oil in water comprising:

a plurality of oil sensors of the type having a limited wavelength light source for causing florescence of oil which may be present in the water, and having a light detector to detect resulting florescence;

means including suspension means attached to each of said sensors for maintaining each sensor at a selected position in the water;

computer means; and,

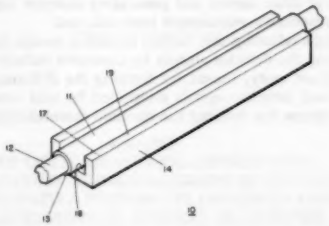
means for connecting each sensor to said computer means to permit said computer to receive and store information generated by each light detector.

4,446,371

CORONA CHARGING APPARATUS

Harold W. Cobb, Acton, Mass., assignor to Delphax Systems, Mississauga, Canada

Continuation-in-part of Ser. No. 244,833, Mar. 17, 1981, abandoned. This application May 24, 1982, Ser. No. 381,600
Int. Cl.³ H01T *19/04*
U.S. Cl. 250—324 **17 Claims**



1. Apparatus for generating ions, the apparatus comprising:

a corona electrode having an elongate conductor and a dielectric layer coating the conductor;

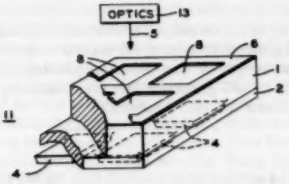
an elongate support structure defining a slot containing and supporting the corona electrode, the support structure including a base and electrically conductive sides having respective side walls which are substantially in contact with the corona electrode, a portion of the dielectric layer being exposed along the length of the slot; and

a time-varying potential between the corona electrode and the electrically conductive sides for creating a glow discharge to form ions in an air region adjacent the exposed portion of the dielectric layer and said side walls.

4,446,372
DETECTOR COLD SHIELD

Mark N. Gurnee, Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1981, Ser. No. 279,297
Int. Cl.[3] H01J *31/49*; G01J *1/00*
U.S. Cl. 250—334 68 Claims



1. An electromagnetic radiation detection system comprising:

optics for viewing a scene emanating electromagnetic radiation, the optics providing a field of view of the scene;

an array of detectors mounted in the path of the field of view of the optics for producing electrical signals representative of the electromagnetic radiation impinging on the detectors;

a shield comprising a first member transparent to a predetermined spectrum of electromagnetic radiation, there being an opaque thin film deposited on a surface of the member, the thin film having apertures defined therein, the detectors viewing the optics through the member and the apertures, the thin film shielding the detectors from electromagnetic radiation generated outside the field of view of the optics to improve the sensitivity of the detector array;

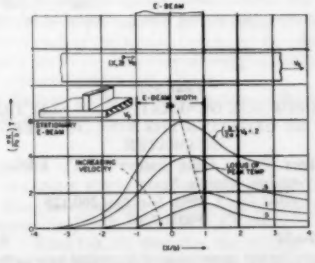
cooling means for cooling the array of detectors and the shield; and

electro-optics coupled to the electrical output of the array for forming a display of the scene viewed by the optics; whereby virtually any desired thickness for the member may be used, thus allowing very close placement of the shield to the detectors and permitting use of very high density arrays.

4,446,373
PROCESS AND APPARATUS FOR CONVERGED FINE LINE ELECTRON BEAM TREATMENT OBJECTS

A. Stuart Denholm, Lincoln; William A. Frutiger, Beverly, and Kenneth E. Williams, Andover, all of Mass., assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 224,313, Jan. 12, 1981, Pat. No. 4,382,186. This application Jan. 3, 1983, Ser. No. 455,266
Int. Cl.[3] H01J *37/00*
U.S. Cl. 250—492.2 34 Claims



1. A process for heat treatment of a solid object of solid material having a major surface by means of electron beam energy, that comprises:

generating and propagating electrons within a vacuum along a predetermined direction and in a linear beam that extends transverse to said direction;

converging the beam into a fine line of intense charge;

impacting the converged fine line beam upon said major surface of the object being treated;

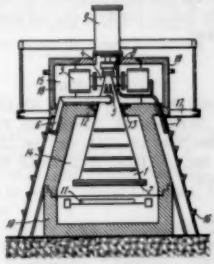
relatively moving said beam and object so that said beam relatively scans said major surface in a direction at right angles to said fine line; and

regulating the kinetic energy of said beam to limit the depth of penetration of said object by said electrons and the power density (flux) of said beam and the velocity with which the latter relatively scans said major surface such that a layer of said object at said major surface with a maximum depth of the order of several microns has its temperature raised sufficiently to effect said heat treatment of said layer while thermal diffusion to the solid material underlying said layer is substantially precluded by limiting the time that any given location on said major surface is impacted by said beam.

4,446,374
ELECTRON BEAM ACCELERATOR

Andrei S. Ivanov, ulitsa Kuznetsovskaya, 8, kv. 33; Leonid V. Komorin, poselok Metallostroi, ulitsa Pushkinskaya, 8, kv. 35; Vladimir I. Nikishkin, ulitsa Yaroslava Gasheka, 2, kv. 459; Mikhail P. Svinlin, poselok Metallostroi, ulitsa Bogaichuka, 4, kv. 25, and Mikhail T. Fedotov, poselok Metallostroi, ulitsa Polevaya, 22, kv. 58, all of Leningrad, U.S.S.R.

PCT No. PCT/SU80/00068, 371 Date Jan. 4, 1982, 102(e) Date Jan. 4, 1982, PCT Pub. No. WO81/03253, PCT Pub. Date Nov. 12, 1981
PCT Filed May 5, 1980, Ser. No. 336,353
Int. Cl.[3] C08J *7/10*; G21K *1/00*
U.S. Cl. 250—492.3 1 Claim



1. An electron beam accelerator comprising:

a radiation protection chamber;

a vacuum chamber having an exit window and positioned within said protection chamber;

an electron beam scanning system positioned adjacent the vacuum chamber opposite to the exit window of said vacuum chamber;

vacuum pumps connected to the vacuum chamber;

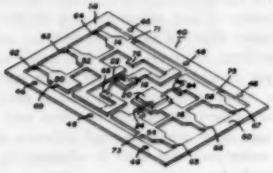
a vacuum monitoring device connected to the vacuum chamber;

said protection chamber including a partition which divides the protection chamber into two compartments, one compartment accommodating the exit window of the vacuum chamber, and the other compartment accommodating the electron beam scanning system, the vacuum pumps and the vacuum monitoring device, said partition blocking X-ray radiation between said compartments and including sealing means to engage said vacuum chamber and provide a substantially air-tight seal between said compartments.

4,446,375
OPTOCOUPLER HAVING FOLDED LEAD FRAME CONSTRUCTION

Alanson D. Aird, No. Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,308
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **10 Claims**



5. An optocoupler comprising:

a plurality of fingers of thin metallic sheet material having outer portions and substantially coplanar middle portions,

said fingers further having inner end portions providing spaced respective bonding sites on which are mounted respectively an emitter element and a detector element,

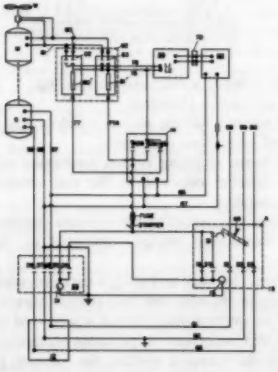
the emitter-carrying finger being bent approximately 180° relative to the bonding site of the detector-carrying finger such that said emitter element lies in a second plane at least approximately parallel to the plane defined by said middle portions and spaced therefrom and said emitter and detector elements are arranged in substantially confronting, proximately spaced relationship,

said opto-coupler further comprising a plurality of additional fingers providing respective additional bonding sites thereon, said additional sites having leads bonded thereto associated with said emitter and detector elements, at least one of said additional fingers being bent approximately 180° in the same direction as said emitter-carrying finger such that its bonding site lies approximately in said second plane.

4,446,376
AUXILIARY POWER SUPPLY SWITCHING SET

Carl R. Baker, 30 Gibson St., North East, Pa. 16428

Filed May 18, 1981, Ser. No. 264,931
Int. Cl.³ F03D *9/02*; H02P *9/04*
U.S. Cl. 290—44 **10 Claims**



1. In combination, a main power supply,

an auxiliary supply,

a service panel,

and switching means for connecting the main power supply to the service panel and for selectively connecting the auxiliary power supply to the load when the voltage of the auxiliary power supply reaches a predetermined value,

said auxiliary power supply comprising a windmill,

a generator,

and a motor, all connected to a common shaft,

a battery,

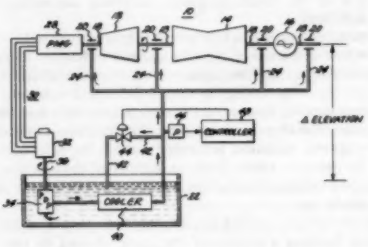
means connecting the output of said generator to said battery,

a sensing means connected to the output of said battery and having means to selectively reverse connect said battery to the output of said motor depending on the voltage output of said generator thereby controlling the speed of said motor and said windmill.

4,446,377
LOW COLLAPSE SPEED LUBE OIL PUMPING SYSTEM FOR TURBOMACHINERY

Jens Kure-Jensen, and Robert A. Marshall, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 3, 1982, Ser. No. 374,416
Int. Cl.³ F01D *25/20*; F02C *7/06*
U.S. Cl. 290—52 **16 Claims**



1. In combination with a turbomachine having a central rotor driven shaft, a lubricating oil system for supplying lubricating oil to the turbomachine, comprising:

a lubricating oil reservoir;

a permanent magnet generator operatively coupled to said shaft and driven thereby to produce an electrical power output having a frequency porportional to the rotary speed of said shaft;

an induction motor connected to receive the electrical power output from said generator, said induction motor being driven thereby at a speed porportional to the frequency of said electrical power output; and

a positive displacement pump operatively coupled to said induction motor and driven thereby to pump oil from said reservoir at a flow rate and pressure sufficient to supply oil to said turbomachine during all operating phases of said turbomachine during which continuous lubrication is required.

4,446,378
SYSTEM FOR THE GENERATION OF ELECTRICAL ENERGY BY UTILIZING THE KINETIC ENERGY OF SEAWATER

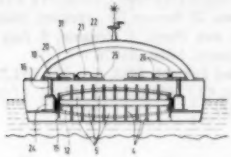
José Martinez Parra, Calle Salitre 33-1°, Edificio Juan XXIII Cartagena, Murcia, Spain

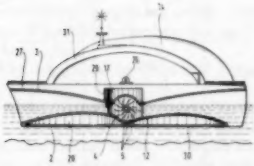
Filed Jul. 2, 1981, Ser. No. 280,125
Int. Cl.³ F03B *7/00, 13/10*
U.S. Cl. 290—54 **6 Claims**

1. A system for the generation of electrical energy by utilizing the kinetic energy of seawater, comprising a floating body having two floating supports, which are connected by a lower platform, a main deck and an impeller mounted on a horizontal

shaft arranged between the upper surface of the lower platform and the lower surface of the main deck for transmitting the motion of the impeller to an installation for converting the kinetic energy into electrical energy, wherein:

(a) the upper surface of the lower platform exhibits a profile which is curved upwards in the longitudinal direction between the bow of the floating body and the impeller and between the impeller and the stern of the floating body with said profile forming a tub-like trough at the location of the impeller wherein said profile between said impeller and said stern curves gradually upward from its formation of said trough with said gradual upward curvature extending in said longitudinal direction toward said stern, and the lower surface of the main deck descends both from the bow and from the stern of the floating body in the direction of the location of the impeller to form there an upward convex projection, the impeller being situated between the tub-like trough in the upper surface of the lower platform and the upward convex projection of the lower surface of the main deck with said impeller shaft extending transverse to said longitudinal direction;





(b) gate means are positioned for selectively closing the aperture between the inner side walls of the floating supports, the upper surface of the lower platform and the lower surface of the main deck approximately at its narrowest point in front of the impeller whereby when the gate is in said closed position the length of said gate extends substantially parallel to the length of said impeller shaft and said gate is located between said bow and the forward-most position of said impeller;

(c) vertical plate-like supports oriented in longitudinal direction of the floating body are located in the region of the impeller between the lower platform and the main deck which supports divide the vanes of the impeller along their width into several sections while being penetrated by the impeller shaft;

(d) the vanes of the impeller are mounted on the impeller shaft in each of the sectors formed by the plate-like supports in such a way that they are staggered with respect to the adjacent sectors; and wherein,

(e) the diameter of the impeller is greater at the middle than at the ends.

4,446,379

MAGNUS EFFECT POWER GENERATOR

John L. Borg, and Catherine J. Borg, both of 8200 Toro Creek Rd., Atascadero, Calif. 93422

Filed Feb. 17, 1983, Ser. No. 467,220

Int. Cl.³ F01D *1/36;* **F03B** *5/00;* **F03D** *9/02*

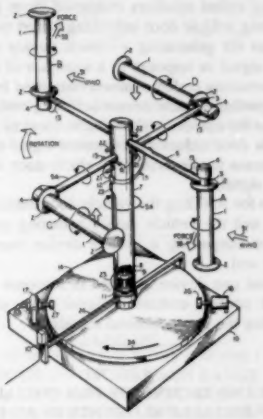
U.S. Cl. 290—55 **7 Claims**

1. A Magnus effect power generator for disposition in a fluid flow having a direction comprising:

(a) a rotatable hub having an axis of rotation;

(b) a shaft mounted on the hub that is freely rotatable about an axis and mounted in a radial direction to the hub axis and extending out opposite sides of the hub;

(c) a rotatable cylinder mounted on the shaft on each side of the hub and each having an axis of rotation at right angles to the fluid flow direction when the shaft is aligned with the fluid flow direction;



(d) means for limiting the rotation of the shaft to approximately 180°;

(e) and means for rotating the cylinders;

whereby a fluid flow in said direction creates a Magnus force at right angles to the fluid flow and thereby rotating the hub and whereby revolving the shaft more than 90° past alignment with the flow direction causes 180° rotation of said shaft to invert the cylinders upon the shaft revolving 180° from the fluid flow.

4,446,380

KEYLESS DEVICE ACTUATING SYSTEM FOR AN AUTOMOTIVE VEHICLE

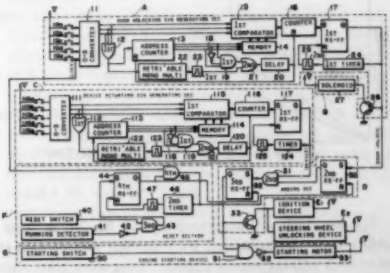
Makoto Moriya, Tokyo, and Haruo Mochida, Aiko, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Nov. 30, 1982, Ser. No. 445,555

Claims priority, application Japan, Feb. 15, 1982, 57-21302

Int. Cl.³ H02J *3/14;* **H02G** *3/00*

U.S. Cl. 307—10 AT **13 Claims**



1. A keyless device-actuating system for an automotive vehicle combined with an electronic vehicle door locking system, which comprises:

(a) means for inputting a sequence of vehicle door unlocking coded numbers and at least one vehicle door locking coded number and outputting signals corresponding thereto;

(b) means for inputting a sequence of vehicle device actuating coded numbers and outputting signals corresponding thereto;

(c) means for generating a vehicle door unlocking command signal in response to a sequence of the vehicle door unlocking coded numbers outputted from said means for inputting vehicle door unlocking coded numbers;

(d) means for generating a vehicle device actuating command signal in response to a sequence of the vehicle device actuating coded numbers outputted from said means for inputting vehicle device actuating coded numbers;

(e) means for unlocking the vehicle doors in response to the vehicle door unlocking command signal outputted from said means for generating a vehicle door unlocking command signal;

(f) means for ANDing the vehicle door unlocking command signal and the vehicle device actuating command signal and for outputting a vehicle device control command signal; and

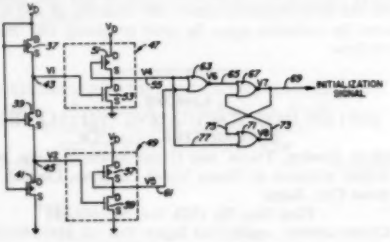
(g) at least one device actuated in response to the vehicle device control command signal from said means for ANDing the two command signals.

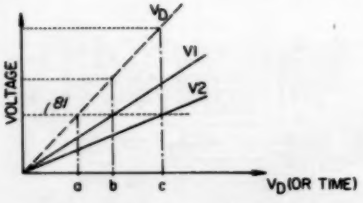
4,446,381

CIRCUIT AND TECHNIQUE FOR INITIALIZING THE STATE OF BISTABLE ELEMENTS IN AN INTEGRATED ELECTRONIC CIRCUIT

Monte J. Dalrymple, Fremont, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Apr. 22, 1982, Ser. No. 370,601
Int. Cl.³ H03K *17/22, 17/30, 17/687*
U.S. Cl. 307—200 B **6 Claims**





1. For use with an integrated circuit having at least one bistable circuit characterized by assuming one of two stable states upon a voltage supply thereto rising from zero, through a threshold switching level of semiconductor elements in said circuit and upward to a maximum voltage supply level, an initiation circuit, comprising:

means associated with said bistable circuit for forcing said circuit to a pre-selected one of its two states in response to an initiation signal,

means connected to said voltage supply for providing a control voltage that rises concurrently with said supply voltage but at a reduced rate to a maximum control voltage that is a fraction of said supply voltage,

a control semiconductor element having substantially the same threshold switching level as those which are part of said bistable circuit and connected to the control voltage in a manner to switch states when the control voltage reaches its threshold switching level, and

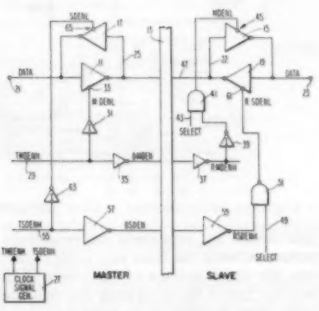
means responsive to the state of said control semiconductor element for maintaining said initiation signal until said control semiconductor element switches states upon the control voltage rising above said threshold switching level, whereby said initiation signal is maintained beyond the time that the semiconductor elements of said bistable circuit have assumed their initial states.

4,446,382

ARRANGEMENT TO TIME SEPARATE BIDIRECTIONAL CURRENT FLOW

Russell L. Moore, 21 Seneca Dr., Hudson, Middlesex County, Mass. 01749, and David J. Schanin, 5 July Rd., Sudbury, Middlesex County, Mass. 01776

Filed Feb. 24, 1982, Ser. No. 351,720
Int. Cl.³ H03K *17/56, 17/62, 17/66*
U.S. Cl. 307—241 **4 Claims**



1. A circuit arrangement for driving electrical current signals, to and from, between a first and a second circuit, wherein said circuits are interconnected by a tri state bus device, comprising in combination: clock signal generating means formed to generate first enable signals and second enable signals, each of which types of enable signals is a gate-like type, and formed to so generate said signals (1) such that the end of any of said first enable signals occurs a predetermined time period before the beginning of a subsequent one of said second enable signals and (2) such that the end of any of said second enable signal occurs a predetermined time period before the beginning of a subsequent one of said first enable signals; first and second controllable current flow means each having a control element and disposed to be connected to each other through said tri state bus device to conduct current in a first direction in response to a first enable signal being applied to the respective control elements of each; third and fourth controllable current flow means, each having a control element and disposed to be connected to each other through said tri state bus device to conduct current in a second direction in response to a second enable signal being applied to the respective control element of each; first control circuit means connected to said clock signal generating means to receive said first enable signals and further connected to the respective control elements of said first and second controllable current flow means to cause current to be conducted therethrough during the presence of said first en-

able signal; and second control circuit means connected to said clock signal generating means to receive said second enable signals and further connected to the respective control elements of said third and fourth controllable current flow means to cause current to be conducted therethrough during the presence of said second enable signal, whereby the time period for current flow in said first direction is separated from the time period for current flow in said second direction, and vice versa, by said predetermined period of time.

4,446,383

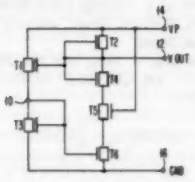
REFERENCE VOLTAGE GENERATING CIRCUIT

Michael P. Concannon, Jericho, and Charles K. Erdelyi, Essex, both of Vt., assignors to International Business Machines, Armonk, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,609

Int. Cl.³ G05F *3/16*

U.S. Cl. 307—297 **5 Claims**



1. A reference voltage generating circuit comprising

a current source coupled between a source of input voltage and an output node;

a series circuit connected between said output node and a source of reference voltage,

said series circuit including a voltage offset means coupled to said output node, a first current controlling device coupled to said voltage offset means and a second current controlling device coupled between said first current controlling device and said source of reference voltage; said first and said second current controlling devices each having a control electrode,

means for coupling the control electrode of said first current controlling device to said source of input voltage;

a source follower circuit having input and output terminals,

means for coupling the input terminal of said source follower circuit to said output node; and

means for coupling the output terminal of said source follower circuit to said control electrode of said second current controlling device so that a constant reference voltage of a predetermined magnitude is produced at said output node.

4,446,384

MIS DEVICE INCLUDING A SUBSTRATE BIAS GENERATING CIRCUIT

Shigenobu Taira, Aizuwakamatsu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 180,451, Aug. 22, 1980, Pat. No. 4,378,506. This application Jan. 10, 1983, Ser. No. 457,026

Claims priority, application Japan, Aug. 27, 1979, 54-108956

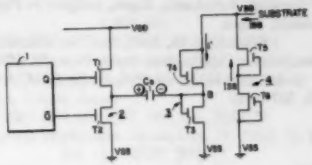
Int. Cl.³ H03K *5/08, 3/01*

U.S. Cl. 307—297 **1 Claim**

1. A MIS device including a substrate bias generating circuit for absorbing charges in a semiconductor substrate thereof, comprising:

a bias circuit, connected to said semiconductor substrate, which performs charging and discharging operations upon said semiconductor substrate in accordance with clock signals so as to absorb said charges in said semiconductor substrate, and

a clamp circuit connected between said semiconductor substrate and a predetermined reference power supply,



the conductance of said clamp circuit being determined so as to satisfy $I_{SS} >> I_{BB}$ where I_{BB} is a substrate current and I_{SS} is a current flowing through said clamp circuit.

4,446,385

VOLTAGE COMPARATOR WITH A WIDE COMMON MODE INPUT VOLTAGE RANGE

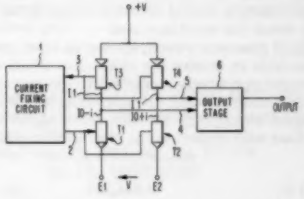
Gerard Orengo, Antibes, and Michel Verhaeghe, Vence, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,865

Claims priority, application European Pat. Off., Dec. 18, 1980, 80430032.5

Int. Cl.³ H03K *5/24*

U.S. Cl. 307—355 **11 Claims**



1. A voltage comparator circuit having a wide common mode input voltage range, comprising:

a pair of input terminals for receiving the voltages to be compared:

input stage means including two input transistors each having a base, emitter and collector electrode with the emitter electrodes of said input transistors respectively coupled to said input terminals and with said collector electrodes respectively connected to two current sources;

current fixing circuit means coupled to said base electrodes and arranged to fix the direct current of said collector electrodes of said input transistors at a first value I0 and the currents supplied by the current sources at a second value k I0, with k>2; and

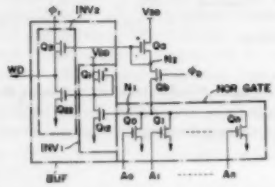
output stage means connected to the said collector electrodes, said output stage means producing a first binary logic level at the output thereof if the voltage at the first of said pair of input terminals is greater than the voltage at the second of said pair of input terminals, and producing a second binary logic level at the output thereof if the voltage at the second of said pair of input terminals is greater than the voltage at the first of said pair of input terminals.

4,446,386

MOS DECODER CIRCUIT USING PHASE CLOCKING FOR REDUCING THE POWER CONSUMPTION

Setsuo Kurafuji, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,661
Claims priority, application Japan, Nov. 29, 1979, 54-154580
Int. Cl.³ H03K *19/096, 19/20*; G11C *8/00*
U.S. Cl. 307—449 **11 Claims**



3. A decoder circuit, operatively connectable to a word line and first and second reference voltages, and operatively connectable to receive a chip select signal and to receive N address signals, said decoder circuit comprising:

a power supply circuit, operatively connectable to receive the chip select signal, for generating first and second voltage signals when the chip select signal is received;

a NOR gate, having a first input operatively connected to said power supply circuit for receiving the first voltage signal, having N address signal inputs for receiving the N address signals, and having an output for generating a first decoded output signal;

an OFF buffer circuit, having a first input operatively connected to the output of said NOR gate for receiving the first decoded output signal, having a second input, having a third input operatively connected to said power supply circuit for receiving the second voltage signal, and having an output operatively connected to the word line for generating a second decoded output signal which is used to select the word line; and

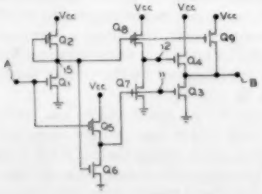
a signal generator circuit, having an input operatively connectable to receive the chip select signal and having an output operatively connected to the second input of said OFF buffer circuit, for generating a delayed chip select signal overlapping the chip select signal and delayed in phase with respect to the chip select signal.

4,446,387

MOS INVERTER-BUFFER CIRCUIT HAVING A SMALL INPUT CAPACITANCE

Tetsuo Misaizu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 39,850, May 17, 1979, Pat. No. 4,264,829. This application Dec. 12, 1980, Ser. No. 215,729
Claims priority, application Japan, May 22, 1978, 53-61491
The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.
Int. Cl.³ H03K *19/017, 19/094, 19/20*
U.S. Cl. 307—450 **10 Claims**



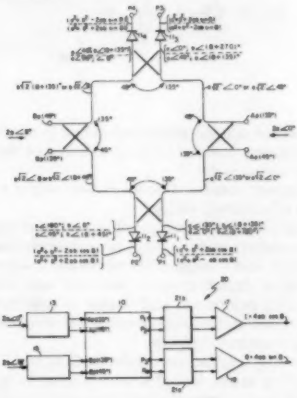
1. A logic circuit comprising an input terminal for receiving an input signal, a first inverter circuit means responsive to said input signal for producing a first signal having a phase which is opposite the phase to said input signal, a second inverter means responsive to said input signal and said first signal for producing a second signal having substantially the same phase as said input signal, a third inverter circuit means responsive to said first signal and said second signal for producing a third signal having substantially the same phase as said first signal and a buffer circuit means responsive to said second signal and said third signal for producing an output signal at its output terminal.

4,446,388

MICROWAVE PHASE DISCRIMINATOR

Francis J. O'Hara, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 6, 1982, Ser. No. 375,514
Int. Cl.³ H01P *1/18*
U.S. Cl. 307—511 **3 Claims**



1. A microwave phase discriminator wherein microwave signals may be commutated to average errors, such discriminator comprising:

(a) a microwave bridge network having two pairs of input ports and two pairs of output ports, the phase shift of microwave signals passing from each one of the input ports in each pair thereof to each one of the output ports being different;

(b) a first set of two single-pole, double-throw switches connected, respectively, to each pair of input ports to apply microwave signals to selected ones of such input ports;

(c) two pairs of diode detectors connected, respectively, to each one of the output ports, the detected signal out of each such detector being related by a square-law relationship to the phase-shifted microwave signals combined at the corresponding output terminal;

(d) a second set of two double-pole, double-throw switches connected to the outputs of the diode detectors; and

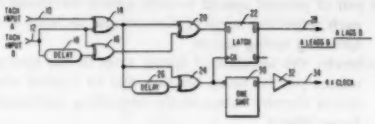
(e) a differential amplifier connected to each one of the two double-pole double-throw switches to produce signals indicative of the instantaneous phase difference between the microwave signals applied to the input ports of the microwave bridge network.

4,446,389

QUADRATURE TACH DECODER CIRCUIT

Marshall Williams, Fremont, and David C. O'Gwynn, San Mateo, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 15, 1982, Ser. No. 358,395
Int. Cl.³ H03K 5/26; H03D 13/00
U.S. Cl. 307—515 7 Claims



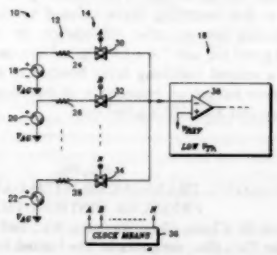
1. Circuit for detecting movement of a member, comprising:
tach means for supplying two quadrature tach pulses in response to member movement;
gate means for receiving said tach pulses and generating tach sequence pulses indicative of which tach phase is leading, and a multiple tach frequency clock;
logic means for generating a logic state change having a first input coupled to receive said tach sequence pulses and a second input coupled to receive said clock, said first input of said logic means being in a first logic state when said clock occurs to indicate a first direction of member movement and being in a second logic state when said clock occurs to indicate a second direction; and
means external to said gate and logic means for delaying said multiple frequency clock so that a reference edge thereof always occurs after said logic state change generated by said logic means.

4,446,390

LOW LEAKAGE CMOS ANALOG SWITCH CIRCUIT

Allan A. Alaspa, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1981, Ser. No. 334,992
Int. Cl.³ H03K 17/16, 17/693
U.S. Cl. 307—579 9 Claims



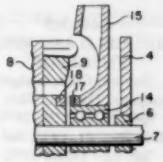
1. A low leakage CMOS analog switch circuit comprising:
a plurality of switching means, each of which is coupled to a predetermined one of a plurality of control signals and each having first and second transistors of first and second conductivity types having a threshold voltage in a first range, each of which has an input coupled to a predetermined one of a plurality of analog input voltages, and all of which have an output coupled together, wherein a predetermined one of said analog input voltages is selectively coupled to the output in response to a predetermined one of the plurality of control signals; and
an interface circuit having an input coupled to the output of said plurality of switching means, comprising a plurality of transistors, each having a threshold voltage in a second range having voltages less than voltages of the first range, said interface circuit providing an interface to circuitry having low voltage thresholds.

4,446,391

ROTATING ELECTRIC MACHINERY

Yasuhiro Sekine; Masayuki Kuwayama, and Hiroshi Harada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1981, Ser. No. 314,029
Claims priority, application Japan, Oct. 24, 1980, 55-149584
Int. Cl.³ H02K 9/06
U.S. Cl. 310—62 3 Claims



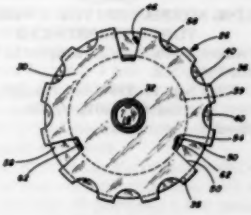
1. A rotating electric machine, comprising:
an armature rotor fixed to a rotatable rotor shaft;
a stationary stator fixed adjacent said rotor;
fan means rotatably mounted via bearing means on said rotor shaft, said fan means including a first surface;
a rotor spider of said rotor spider having a second surface facing said first surface on an axis substantially perpendicular to said rotor shaft and separated therefrom by a predetermined gap;
magnet means having at least two poles and fixed to one of said first and second surfaces; and
a magnetic material fixed to the other of said first and second surfaces, whereby said magnet means and said magnetic material face one another axially and are separated by said predetermined gap.

4,446,392

ELECTROMAGNETIC COUPLING DEVICE

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1982, Ser. No. 377,896
Int. Cl.³ H02K 49/02
U.S. Cl. 310—105 18 Claims



1. An electromagnetic coupling device comprising an input member and an output member rotatable relative to said input member, a pole assembly associated with one of said input and output members, said pole assembly including a pair of annular, oppositely disposed pole members, an annular core member disposed between said pole members and defining an annular cavity therebetween, an electrically energizable field coil element disposed in said cavity for electromagnetically coupling said input and output members, said pole members each including a plurality of circumferentially spaced, radially extending pole slot means disposed for communicating the exte-

rior of said pole assembly with said core member to provide substantially uninterrupted access thereto, said pole slot means being symmetrically oriented and opening outwardly onto the periphery of associated pole members, said pole slot means having a radial depth sufficient to extend beyond the corresponding radial dimension of said field coil element so as to provide direct access from the exterior of said pole assembly to said core member, and wherein the radial innermost extremity of said slot means and the confronting exposed surface of said core member together define clearance areas adapted to receive therein securement means for affixedly attaching said core member in sandwiched relation between said pole members.

4,446,393

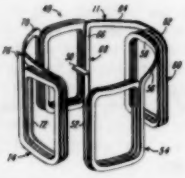
DYNAMOELECTRIC FIELD ASSEMBLY AND WINDING THEREFOR

Hyman B. Finegold, Dayton, Ohio, assignor to The Globe Tool & Engineering Company, Dayton, Ohio

Division of Ser. No. 736,880, Oct. 29, 1976, Pat. No. 4,131,988. This application Dec. 21, 1978, Ser. No. 971,686

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—184 **5 Claims**



1. A one-piece field winding for a dynamoelectric machine comprising a length of strapping edge wound into at least three laterally spaced coils, each coil having plural convolutions, and each coil connected to at least one other coil by an integral portion of said strapping, the portions of said strapping interconnecting said coils supporting said coils in a circular array of circumferentially spaced coils, and the portions of said strapping extending integrally between coils connected thereby each extend from a radially outermost convolution of one of the connected coils to a radially innermost convolution of the other of the connected coils.

4,446,394

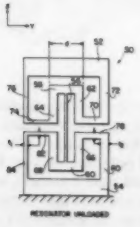
LINEARIZING MECHANISM FOR A VIBRATING BEAM FORCE TRANSDUCER

William C. Albert, Boonton, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Sep. 14, 1981, Ser. No. 301,622

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—321 **5 Claims**



1. A force transducer comprising a vibrating beam having a longitudinal axis and adapted to vibrate in a plane including the axis;

a supporting element secured to each end of the beam and extending in both directions tranversely of the axis;

a pair of end mounts;

axially complaint isolator spring means each having multiple sections of unbalanced spring rates and extending between each end mount and a corresponding support element for transmitting axial forces from the end mounts to the beam along the longitudinal axis thereof; and

a pair of parallel spaced isolator means connected between each respective support element and sections of a corresponding spring means;

whereby the unbalanced spring rates of the spring means induce precise beam bending due to applied vibrational forces thereby substantially cancelling undesirable nonlinear effects.

4,446,395

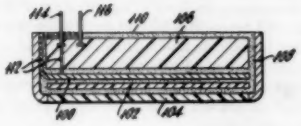
SHORT RING DOWN, ULTRASONIC TRANSDUCER SUITABLE FOR MEDICAL APPLICATIONS

Andreas Hadjicostis, North Brunswick, N.J., assignor to Technicare Corporation, Solon, Ohio

Filed Dec. 30, 1981, Ser. No. 335,920

Int. Cl.³ H01L *41/08*; A61B *10/00*

U.S. Cl. 310—327 **21 Claims**



1. A high efficiency, piezoelectric transducer suitable for medical imaging applications, having a 40 dB ring down time of less than 3 cycles at an emission frequency suitable for medical imaging use, comprising:

(a) a preformed backing material having a mating surface with a flatness of at least 0.0002 inches;

(b) a single crystal, lithium niobate active element bonded to said mating surface of said backing material;

(c) a first matching layer bonded to said active element having an acoustic impedance of between 6.8×16^6 Kg/m^2 sec and 7.4×10^6 Kg/m^2 sec; and

(d) a second matching layer bonded to said first matching layer having an impedance of between 1.8×10^6 Kg/m^2 sec and 2.4×10^6 Kg/m^2 sec.

4,446,396

ULTRASONIC TRANSDUCER WITH GAUSSIAN RADIAL PRESSURE DISTRIBUTION

Richard O. Claus, Christiansburg, Va., and Paul S. Zerwekh, Palm Bay, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 2, 1982, Ser. No. 414,107

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—334 **7 Claims**

1. An ultrasonic transducer having a radial pressure distribution corresponding to a symmetrical function comprising:

means for supplying an AC voltage;

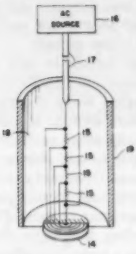
a piezoelectric crystal;

several concentric circular ring electrodes attached to one side of said piezoelectric crystal; and

means for applying a different amplitude of said AC voltage to each of said electrodes;

wherein a plot of said different amplitudes applied to said electrodes from the outermost to the innermost is a plot that fits one-half of said symmetrical function;

whereby any cross-section through the center of the ultrasonic signal emitted from the side of said piezoelectric



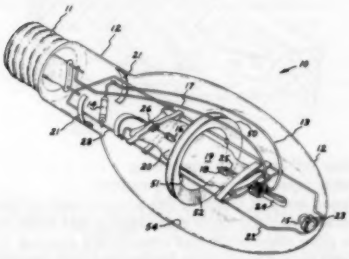
crystal opposite said one side has a pressure distribution corresponding to said symmetrical function.

4,446,397

HIGH INTENSITY DISCHARGE LAMP WITH INFRARED REFLECTING MEANS FOR IMPROVING EFFICACY

Peter D. Johnson, and Seth D. Silverstein, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1981, Ser. No. 305,820
Int. Cl.³ H01J *61/35, 61/40, 61/52*
U.S. Cl. 313—25 **3 Claims**



1. A high intensity discharge lamp comprising:
a gas-tight arc discharge tube having electrodes disposed at opposite ends thereof and containing an ionizable medium;
an outer gas-tight envelope surrounding said arc tube;
metal wire means for supporting said arc tube within said envelope and for supplying electric power to said electrodes; and
an infrared radiation reflector transparent to visible light, having an arcuate section at least partially surrounding the central portion of the arc tube and having a generally V-shape cross section with the base of the V-shape portion directed toward the arc tube, said reflector arranged to reflect infrared radiation from the central portion of the arc tube onto the end portions of the arc tube.

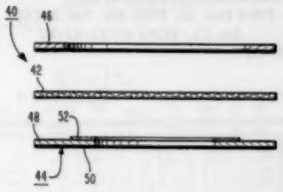
4,446,398

VIBRATION INHIBITING MESH ASSEMBLY FOR A PICK-UP TUBE

Elvin M. Musselman, Ronks, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,313
Int. Cl.³ H01J *29/02, 1/90*
U.S. Cl. 313—390 **6 Claims**

1. In a pick-up tube having an evacuated envelope, a faceplate at one end of said envelope, a target electrode adjacent to said faceplate, a cathode in the other end of said envelope and a mesh assembly disposed in spaced relation adjacent to said target electrode, between said target electrode and said cathode, the improvement wherein said mesh assembly comprises
a mesh electrode disposed between an annular support ring having an inside diameter, d_1, and an outside diameter, d_2,



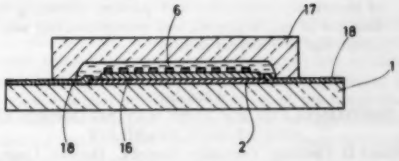
and an annular retaining ring having an inside diameter, d_3, wherein d_3 is greater than d_1 but less than d_2, said annular support ring having a support surface facing said mesh electrode, said support surface having a fusion-resistant material thereon in contact with said mesh electrode.

4,446,399

STRUCTURE OF THIN ELECTROLUMINESCENT DISPLAY PANEL SEALED BY GLASS SUBSTRATES

Yoshihiro Endo; Masashi Kawaguchi; Etsuo Mizukami, and Hiroshi Kishishita, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1981, Ser. No. 270,882
Claims priority, application Japan, Jun. 13, 1980, 55-80346
Int. Cl.³ H05B *33/04, 33/06*
U.S. Cl. 313—505 **8 Claims**



1. A thin-film electroluminescent display panel comprising:
first and second substrates bonded together and sealed so as to define a cavity therebetween,
a composite comprising a thin-film electroluminescent layer interpositioned between a pair of dielectric layers, said composite being disposed within said cavity, at least one of said first and second substrates being transparent to light emitted by said electroluminescent layer when said layer is properly stimulated;
at least one pair of opposing electrodes positioned so as to sandwich said composite therebetween, each of said pair of opposing electrodes comprising a first transparent porous electrode material, adjacent said at least one transparent substrate, contained completely within said cavity so as not to extend into or beyond said seal between said first and second substrates thereby preventing moisture from penetrating into said cavity, and a second metallic counterelectrode;
a protective liquid provided within said cavity defined by said substrates and being in contact with said dielectric layers, and
terminal means connected within said cavity to said respective transparent electrodes for providing a lead connection for said electroluminescent layer to a power source means outside said cavity, said terminal means comprising

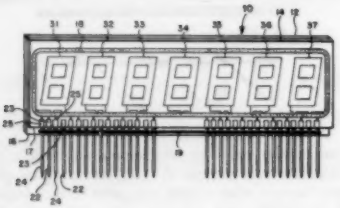
a metal and said respective transparent electrodes being longer than the length of said electroluminescent layer.

4,446,400

GASEOUS DISPLAY PANEL WITH WEBBED ANODE

Walter L. Cherry, Winnetka, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Dec. 16, 1980, Ser. No. 217,091
Int. Cl.³ H01J *61/12, 61/66*
U.S. Cl. 313—517 **5 Claims**



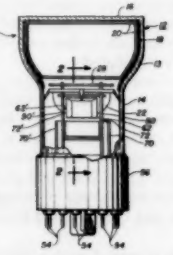
1. A gaseous display panel comprising:
a base plate sealed to a face plate;
a plurality of groups of cathode segments disposed on said base plate, each of said groups being displaced from one another, and being adapted to form any of a plurality of recognizable indicia; and
a plurality of anode means disposed on said face plate, each in facing relation to a corresponding one of said groups of cathode segments; each of said anode means having a first length of electrically conductive material located, at least in part, a spaced distance from one side of at least one of said segments, a second length of electrically conductive material located, at least in part, a spaced distance from an opposite side of said one of said segments, and a plurality of electrically conductive web portions extending across said one of said segments, and interconnecting said first length and said second length.

4,446,401

PHOTOMULTIPLIER TUBE HAVING IMPROVED COUNT-RATE STABILITY

Richard D. Faulkner, Lancaster; Daniel L. Thoman, Leola, and Arthur F. McDonie, Lancaster, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,287
Int. Cl.³ H01J *40/00*
U.S. Cl. 313—533 **4 Claims**



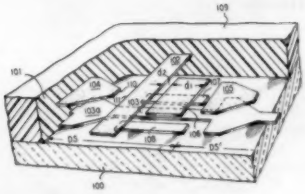
4. In a photomultiplier tube comprising an evacuated envelope, a photoemissive cathode within said envelope, an anode spaced from said photoemissive cathode, a plurality of dynodes disposed between said cathode and said anode for propagating and concatenating electrons along a path between said cathode and said anode, said dynodes comprising a primary dynode, a secondary dynode, a penultimate dynode and an ultimate dynode, and a pair of oppositely-disposed insulating support plates for supporting said dynodes and said anode, said plates having an interior and an exterior surface, the improvement wherein said support plates include
at least one aperture formed in each of said support plates, said aperture substantially conforming to the shape of the interelectrode region along the electron path extending from said secondary dynode to said penultimate dynode and at least partially along said path extending from said penultimate dynode to said ultimate dynode, and
focusing means spaced from said exterior surface of each of said support plates, said focusing means being disposed adjacent to said aperture in each of said plates, said focusing means extending longitudinally along said electron path for providing a transverse electrostatic focusing field to prevent substantially all of said electrons from impinging upon said interior surface of each of said support plates.

4,446,402

PLANAR AC PLASMA DISPLAY HAVING GLOW SUPPRESSOR ELECTRODE

George W. Dick, Sinking Springs, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1982, Ser. No. 362,097
Int. Cl.³ H01J *61/04*
U.S. Cl. 313—586 **25 Claims**



1. Display cell apparatus comprising
a dielectric layer having a planar surface,
an enclosed body of ionizable gas adjacent said surface,
first and second conductors embedded in said layer, and
a single glow suppression pad capacitively coupled to said first and second conductors biasing said glow suppression pad at a voltage intermediate the voltage on said first and second conductors.

4,446,403

COMPACT PLUG CONNECTABLE ION SOURCE

Jerome J. Cuomo, Lincolndale; James M. E. Harper, Yorktown Heights, both of N.Y., and Harold R. Kaufman, Fort Collins, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1982, Ser. No. 382,266
Int. Cl.³ H01J *7/24*
U.S. Cl. 315—111.81 **8 Claims**

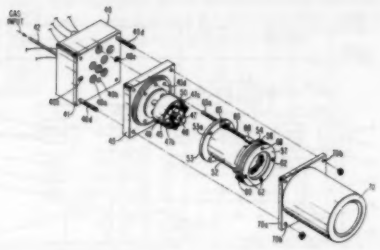
1. An ion generator comprising:
a socket member, said socket member having a plurality of apertures containing electrical connectors, and a further aperture for receiving a gas feed tube;
a mating base insulator including a plurality of electrical pins on one side thereof for mating with said electrical connectors, said insulator base pins extending through said base insulator to an opposite side thereof and including a gas feed aperture extending through said insulator to said opposite side facing said socket member further aperture;
a magnet assembly located on said base insulator opposite side including a center pole piece and an outer pole piece circumferentially surrounding said center pole piece, said

pole pieces providing an arcuate extending magnetic fringe field between ends of said pole pieces;

a filament member connected between a pair of said pins extending into said magnetic field forming a cathode;

an anode member spaced apart from said cathode and connected to one of a remaining of said plurality of pins;

a source body for enclosing said cathode, anode, and magnet assembly having one end abutting said insulator and a remaining open end, said source body forming an ionization chamber;



first and second grid members connected to said open end, said grid members each electrically connected to one of a pair of said electrical pins, said grid members forming exit apertures for ions within said ionization chamber, said base insulator, source body and grid members forming a detachable ion generator having electrical pins for mating with said socket whereby electrical voltages and an ionizing gas are provided to said ion generator.

4,446,404

DIRECTLY HEATED OXIDE CATHODE AND PRODUCTION THEREOF

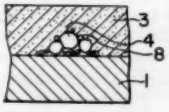
Masaharu Kumada, and Akira Misumi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,742

Claims priority, application Japan, Sep. 12, 1979, 54-116068; Jan. 23, 1980, 55-5672

Int. Cl.³ H01J *11/04*

U.S. Cl. 313—346 R **13 Claims**



1. A directly heated type oxide cathode comprising a base made of an alloy containing Ni as a major component and Zr as a reducing agent, a coating of Co powders or Co-Ni alloy powders containing Co in the amount of 80% by weight or more, or a coating of a mixture of Ni powders or Ni alloy powders and Co powders wherein the average particle size of the Co powders is smaller than that of the Ni or Ni alloy powders, formed on the base and an electron emissive alkaline earth oxide layer formed on the coating of Co powders or Co-Ni alloy powders or the mixture of Ni or Ni alloy powders and Co powders.

4,446,405

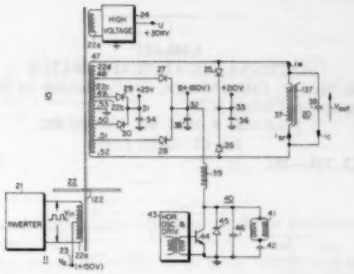
TELEVISION RECEIVER FERRORESONANT LOAD POWER SUPPLY

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 220,847, Dec. 29, 1980, abandoned. This application May 28, 1982, Ser. No. 383,056

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **12 Claims**



1. A television system with a ferroresonant load regulated high voltage power supply, comprising:

a source of unregulated alternating input voltage;

a transformer having primary, secondary and high voltage windings, said primary winding being coupled to said source for developing alternating polarity voltages across said secondary and high voltage windings that tend to undesirably vary with variations of said unregulated voltage;

a high voltage circuit coupled to said high voltage winding for developing an ultor voltage from the high voltage winding alternating polarity voltage; and

a ferroresonant saturable reactor core and a load coil wound on said core and conductively coupled to and magnetically isolated from said transformer secondary winding, said ferroresonant saturable reactor load coil being responsive to and providing regulation of the transformer secondary winding alternating polarity voltage for developing a regulated alternating polarity voltage across said high voltage winding.

4,446,406

BRUSHLESS DC MOTOR DRIVING CIRCUIT

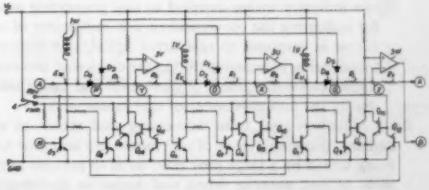
Mitsuo Uzuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 479,868

Claims priority, application Japan, Apr. 2, 1982, 57-54871

Int. Cl.³ H02K *23/00*

U.S. Cl. 318—254 **25 Claims**



1. A driving circuit for a brushless DC motor of the kind having a stator with a plurality of windings, comprising:

switching means connected to respective ones of said wind-

ings and to a power source for selectively supplying a driving current to said windings;

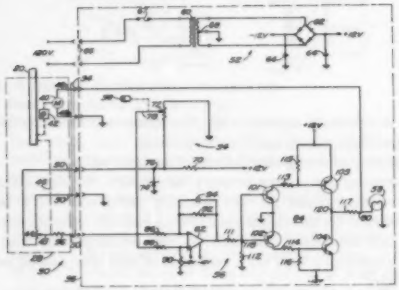
means for comparing predetermined ratios of voltages induced in said windings by said driving current with a reference voltage and producing control signals representing the results of said comparing, said control signals being fed to said switching means for controlling the operation thereof, whereby said windings are selectively energized by said power source to cause said motor to produce optimum torque.

4,446,407

ANTENNA ROTATOR APPARATUS

Martin Sperber, Santa Monica, Calif., assignor to Intercept Corporation, Clifton, N.J.

Filed Mar. 8, 1982, Ser. No. 355,401
Int. Cl.³ G05B 1/06
U.S. Cl. 318—282 7 Claims



1. An apparatus for driving an antenna rotator comprising:

(a) a circuit comprising:

(1) means for sensing the orientation of an antenna,

(2) means for commanding an orientation of said antenna,

(3) means for generating a drive signal, said generating means being responsive to a difference between a command signal of said commanding means and an orientation signal of said sensing means,

(4) a D.C. motor for rotating said antenna to a desired orientation as commanded by said commanding means, said motor being driven either clockwise or counterclockwise by said drive signal of said generating means to achieve said desired orientation,

(5) a multiple-conductor cable connecting said motor and said sensing means with said generating means, one conductor of said cable serving as a separate electrical ground return for said motor, and a second conductor of said cable serving as a separate electrical ground return for said sensing means for decoupling input and output terminals of said generating means, thereby insuring stable operation of said generating means; and

(6) an indicator means coupled to said generating means for indicating the movement or non-movement of said motor in response to said drive signal, said indicator means being illuminated during the clockwise and counterclockwise movement of said motor and extinguished during the non-movement of said motor; and

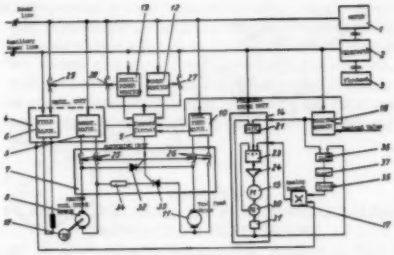
(b) a reduction gear train connecting said motor to said antenna, frictional forces of said motor and said gear train being scaled by a large gear ratio so as to prevent movement of said antenna when said motor is de-energized while permitting facile rotation of said antenna by said motor, said sensing means and said motor being located adjacent said antenna and distant from said generating means.

4,446,408

CONTROL CIRCUIT FOR MACHINE TOOLS

Joachim Ebermann; Heinz Gräf; Siegfried Schleicher, and Jürgen Uhlig, all of Karl-Marx-Stadt, German Democratic Rep., assignors to Veb Werkzeugmaschinenkombinat "7 Oktober" Berlin, Berlin, German Democratic Rep.

Filed Oct. 28, 1981, Ser. No. 315,988
Claims priority, application German Democratic Rep., Nov. 14, 1980, 225189[U]
Int. Cl.³ G05B 19/26
U.S. Cl. 318—600 24 Claims



1. Control apparatus for machine tools comprising

a digital branch having an output;

a follower drive having an output;

a pulsed digital difference detector having one input connected to the digital branch and having a second input connected to the follower drive and having an output;

an adding register having its input connected to the output of the pulsed digital difference detector;

an analog nominal value source having its control input connected to the output of the adding register; and

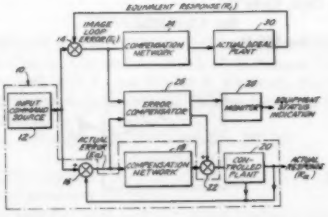
an analog branch having an input connected to the analog nominal value source and having its output connected to the input of the follower drive.

4,446,409

ELECTRONIC CONTROLLER APPARATUS

Harris C. Rawicz, Bridgewater; Vincent J. Rizzo, Basking Ridge, and William R. Buntemeyer, Washington, all of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Mar. 22, 1982, Ser. No. 360,789
Int. Cl.³ G05D 23/275
U.S. Cl. 318—632 5 Claims



1. In combination in apparatus for controlling a controlled element; primary feed back loop means including feed back signal supplying means for supplying a signal representing the state of the controlled element, an input signal source, first difference means having inputs connected to said input signal source and to said feed back signal supplying means for providing a primary loop error signal, and forward gain means responsive to said primary loop error signal generated by said first difference means for driving the controlled element; image feed back loop means including controlled element simulating

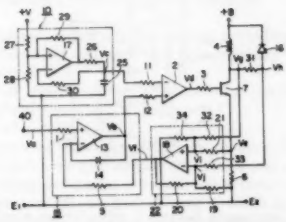
means, second difference means having inputs connected to said input signal source and to an output of said simulating means for providing an image loop error signal, and second forward gain means connecting said second difference means and said simulating means; and third difference means, having inputs connected to said first and second difference means for augmenting the drive applied to the controlled element responsive to the difference between said error signals in said primary and image feed back loop means, wherein said third difference means includes integrating steady state means responsive to the error signal difference in said primary and image feed back loop means, and multiplier means for multiplying the output of said steady state means and said primary feed back loop error signal determined by said first difference means.

4,446,410

CONTROL CIRCUIT FOR A SOLENOID-OPERATED ACTUATOR

Toshiaki Yagura; Kenichiro Satoyama, both of Kariya; Kazutoshi Morisada, Obu; Ryoichi Yamamoto, Aichi, and Seietsu Yoshida, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 21, 1982, Ser. No. 341,502
Claims priority, application Japan, Jan. 22, 1981, 56-8164
Int. Cl.³ G05B *11/00*
U.S. Cl. 318—687 **8 Claims**



1. A control circuit for controlling a solenoid-operated actuator having a coil in response to a control signal, comprising:

a switching element connected in series with said coil for generating a drive current in said coil when rendered conductive;

a drive current sensing resistor coupled in a series circuit with said switching element and said coil to develop a first voltage in response to said switching element being rendered conductive;

a surge current sensing resistor coupled in a parallel circuit including a unidirectionally conducting element with said coil to develop a second voltage in response to said switching element being rendered nonconductive;

a differential amplifier responsive to said first and second voltages to generate a difference signal;

a differential integrator having a first input responsive to said control signal and a second input responsive to said difference signal;

a ramp generator for generating a ramp voltage; and

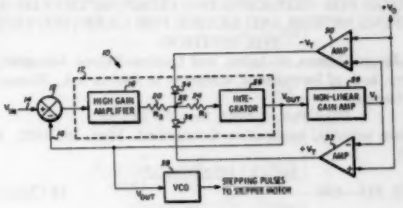
a comparator for comparing an output signal from said differential integrator with the instantaneous value of said ramp voltage to provide a pulse to said switching element to render the same conductive.

4,446,411

OPTIMUM ACCELERATION/DECELERATION CIRCUIT

Hubert Song, Sunnyvale, Calif., assignor to Verbatim Corporation, Sunyvale, Calif.

Filed Dec. 11, 1981, Ser. No. 329,715
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **5 Claims**



1. An acceleration/deceleration circuit for stepper motors, comprising:

mixing means responsive to an input voltage and a speed output voltage for generating an error signal having a voltage approximately equal to the difference between said input voltage and said speed output voltage;

a rate limiter for generating said speed output voltage and responsive to said error signal whereby said speed output voltage increases when an acceleration control voltage is received by the rate limiter and said speed output voltage decreases when a deceleration control voltage is received by the rate limiter;

a non-linear gain amplifier connected to the output of the rate limiter responsive to said speed output voltage for developing a complementary control voltage;

first summing means connected to the output of the non-linear gain amplifier responsive to said complementary control voltage for generating said acceleration control voltage; and

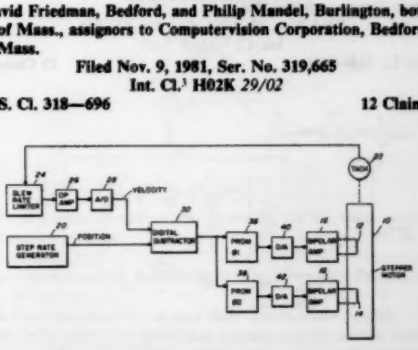
second summing means connected to the output of the non-linear gain amplifier responsive to said complementary control voltage for generating said deceleration control voltage.

4,446,412

METHOD AND APPARATUS FOR CONTROLLING STEPPER MOTORS

David Friedman, Bedford, and Philip Mandel, Burlington, both of Mass., assignors to Computervision Corporation, Bedford, Mass.

Filed Nov. 9, 1981, Ser. No. 319,665
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—696 **12 Claims**



1. A method for critically damping the natural resonance of a stepper motor, said method comprising the steps of:

(a) generating position signals;

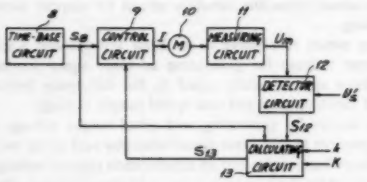
(b) generating a digital velocity signal representing the velocity of the stepper motor shaft;
(c) generating a digital error signal functionally related to said position signals and said digital velocity signal; and
(d) generating command currents for driving the stepper motor and critically damping the natural resonance of the stepper motor in response to said digital error signal.

4,446,413

METHOD FOR REDUCING THE CONSUMPTION OF A STEPPING MOTOR AND DEVICE FOR CARRYING OUT THE METHOD

Hans-Jürgen Rémus, St-Aubin, and Luciano-Marco Antognini, Lutry, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Feb. 4, 1982, Ser. No. 345,952
Claims priority, application Switzerland, Mar. 18, 1981, 1 826/81
Int. Cl.³ H02K 29/02
U.S. Cl. 318—696 **16 Claims**



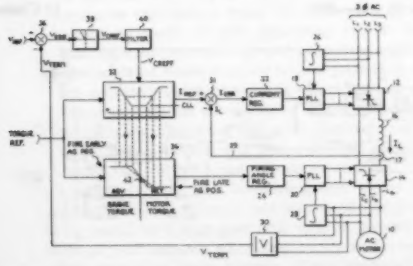
1. A method for reducing the power consumption of a stepping motor of the type having a coil and a rotor magnetically coupled to the coil and rotated in response to driving pulses applied to the coil, comprising the steps of:
measuring during each driving pulse the voltage induced in the coil by the rotation of the rotor;
measuring the time interval between the beginning of the driving pulse and the moment at which the induced voltage becomes equal to a reference voltage; and,
terminating the driving pulse according to said period of time whereby said driving pulses have a duration which relates to a load on said motor.

4,446,414

TERMINAL VOLTAGE LIMIT REGULATOR FOR A LOAD COMMUTATED INVERTER

Leland C. Tupper, Schenectady, N.Y., assignor to General Electric Company, Salem, Va.

Filed Nov. 19, 1981, Ser. No. 322,741
Int. Cl.³ H02P 5/40
U.S. Cl. 318—723 **13 Claims**



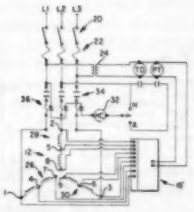
1. A method of controlling an AC motor load driven by a thyristor inverter which supplies a load current of varying magnitude and frequency to said motor load, comprising the steps of:
(a) varying the motor load current and the thyristor inverter firing angle according to a first firing angle strategy in response to a torque reference signal generated for a desired motor torque, said first firing angle strategy being that of firing at the commutation limit point and controlling motor torque as a function of motor current;
(b) sensing the terminal voltage of the motor load;
(c) comparing said terminal voltage against a preselected reference voltage; and
(d) in the event that said terminal voltage exceeds said reference voltage, increasing the minimum motor load current and changing the firing angle strategy from said first strategy to a second firing angle strategy, said second firing angle strategy acting to regulate motor load current to the desired minimum load current and controlling motor torque by controlling the thyristor firing angle.

4,446,415

AUTOMATIC LOAD SEEKING CONTROL FOR A PUMPJACK MOTOR

Noel R. Taylor, 2512 Bonham, and Paul A. Taylor, 1548 Tanglewood, both of Odessa, Tex. 79762

Continuation of Ser. No. 27,798, Apr. 6, 1979, Pat. No. 4,220,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Jun. 5, 1980, Ser. No. 156,740
The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.
Int. Cl.³ H02P 5/28, 1/32
U.S. Cl. 318—798 **30 Claims**



1. In an apparatus having a three phase motor which is subjected to a torque which varies from one time interval to another time interval, the stator of which can be connected in either of Y, ΔY, and Δ configuration, the improvement comprising:
first circuit means for connecting the stator in Y configuration; said circuit means includes a first sensor means for measuring the current flow through said Y connected stator and for disconnecting said Y connected stator upon the current flow through said Y connected stator exceeding a first maximum average value during a first time interval;
second circuit means for connecting the stator in ΔY configuration upon said first circuit means being disconnected by said first sensor means;
said second circuit means includes a first timer means by which said second circuit means disconnects said ΔY configuration and said first circuit means again connects said stator in Y configuration after a predetermined time interval has expired;
third circuit means and a second sensor means, said second sensor means measures the current flow through said ΔY connected stator and causes said second circuit means to disconnect said ΔY configuration while connecting said stator in Δ configuration upon the average current flow through said ΔY stator exceeding a second maximum average value during a second time interval;

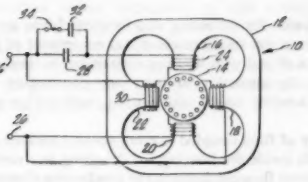
said third circuit means further includes a second timer by which said Δ connection is disconnected by said third circuit means and said second circuit means again connects the stator in ΔY configuration after a predetermined time interval has expired; and means by which the response rate of said first and said second sensor means is proportional to the severity of overload, so that at relatively low overloads the circuit means requires a relatively long time interval for changing the stator winding configuration, while at relatively high overloads the circuit means requires a relatively short time interval for changing stator winding configuration.

4,446,416

POLYPHASE ELECTRIC MACHINE HAVING CONTROLLED MAGNETIC FLUX DENSITY

Cravens L. Wanlass, 3739 Meadow Wood Rd., Carson City, Nev. 89701

Filed Aug. 14, 1979, Ser. No. 66,410
Int. Cl.³ H02P *1/44, 5/00*
U.S. Cl. 318—812 **56 Claims**



1. A polyphase electric machine comprising:
a stator including a core of magnetic material;
a rotor;
a main polyphase stator winding having a winding for each phase wound on said core and encompassing said magnetic material;
a plurality of input terminals adapted to be connected to a source of polyphase AC voltage;
a plurality of capacitors;
means connecting the main windings of each phase in a series circuit with one of said capacitors and said series circuits being connected with said input terminals; and
a polyphase control winding having a winding for each phase wound on said core to encompass said magnetic material and connected respectively to said plurality of input terminals at least partly in parallel with the respective main windings and the series connected capacitances of each respective phase, such that on low load current flows in opposite directions across radially adjacent windings of the main winding and the control winding and such current flow becomes increasingly in the same direction as the load increases, and wherein respectively different phases of the main windings and control windings are in substantially physical radial alignment.

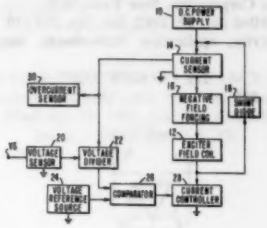
4,446,417

VOLTAGE REGULATOR FOR AIRCRAFT GENERATORS

David A. Fox, Shawnee Township, Allen County, and Lynn L. Tipton, American Township, Allen County, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1982, Ser. No. 348,395
Int. Cl.³ H02P *9/00;* **H02H** *7/06*
U.S. Cl. 322—25 **6 Claims**

1. A voltage regulator circuit for a generator with an exciter field coil, said circuit comprising;
means for sensing current in said exciter field coil and for producing a first voltage signal proportional to said current;
means for sensing voltage derived from the output voltage of said generator and for producing a second voltage signal proportional to said voltage;
means for combining said first voltage signal and said second voltage signal and for producing a third voltage signal, wherein said means for combining the first voltage signal and the second voltage signal is a branch circuit including, the series connection of a first resistor, a capacitor, and a second resistor, with the capacitor being connected between said first and second resistors;



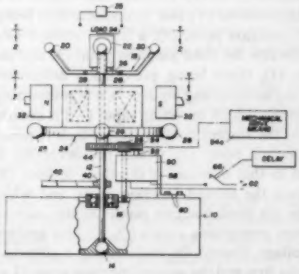
said first and second voltage signals being impressed on opposite ends of said branch circuit with said second voltage signal being impressed on one end of said second resistor, to produce said third voltage signal at the connection point between the capacitor and the second resistor;
a source of reference voltage;
means for comparing said third voltage signal with said reference voltage and for producing a fourth voltage signal;
means for controlling current in said excitier field coil, responsive to said fourth voltage signal.

4,446,418

GENERATOR AND DRIVE SYSTEM

Royest L. Richardson, 305 W. Home, Flint, Mich. 48505

Continuation-in-part of Ser. No. 100,952, Dec. 6, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,506
Int. Cl.³ H02K *7/02*
U.S. Cl. 322—4 **10 Claims**



1. A generator system for providing an electrical power output, comprising:
a central shaft;
a support bearing for rotatably supporting said shaft at its lower end;
a flywheel mounted on said shaft intermediate its end;
an input means for providing a rotative drive to said shaft;
a gyro of the vibratory type mounted on said shaft proximate its upper end; said gyro including a plurality of relatively thin rods extending symmetrically from said shaft, each such rod including a weight mounted on its free end; and

means for periodically interrupting the drive to said shaft, said flywheel and said gyro operable to continue the rotation of said shaft during such periodic interruption.

4,446,419

CURRENT STABILIZING ARRANGEMENT

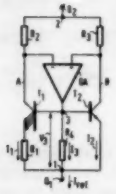
Rudy J. van de Plassche; Eise C. Dijkmans, and Hendrikus J. Schouwenaars, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,170

Claims priority, application Netherlands, Aug. 14, 1981, 8103813

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—316 **3 Claims**



1. A current stabilizing arrangement comprising a first and a second series circuit (A and B respectively), which are each connected between a first and a second junction point (1 and 2 respectively), which first series circuit (A) comprises the main current path of a first transistor (T_1) of a first conductivity type, a first resistor (R_1), and a second resistor (R_2), and which second series circuit (B) comprises the main current path of a second transistor (T_2) of the first conductivity type, having an emitter area which is smaller than that of the first transistor (T_1), and a third resistor (R_3), suitably having a value equal to that of the second resistor (R_2), which first resistor (R_1) is arranged between the emitter of the first transistor (T_1) and the first junction point (**1**), which second resistor (R_2) is arranged between the collector of the first transistor (T_1) and the second junction point (**2**), and which third resistor (R_3) is arranged between the collector of the second transistor (T_2) and the second junction point (**2**), the base connections of the first and the second transistor (T_1 and T_2 respectively) being connected to a third junction point (**3**), a fourth resistor (R_4) being arranged between the third junction point (**3**) and the first junction point (**1**), there being provided a differential amplifier (OA) having an inverting input (−), a non-inverting input (+), and an output, which inverting input (−) is connected to that terminal of the second resistor (R_2) which is remote from the second junction point (**2**), which non-inverting input (+) is connected to that terminal of the third resistor (R_3) which is remote from the second junction point, and which output is coupled to the third junction point (**3**), the current stabilizing arrangement comprising means (Q_1, Q_2) for applying a power-supply voltage thereto for maintaining a potential difference between the first and the second junction point (**1** and **2** respectively) and for taking off a stabilized current from one of said points, characterized in that between the emitter of the first transistor (T_1) and the first junction point (**1**) there is arranged at least one third transistor (T_3) of the first conductivity type, arranged as a diode which is poled in the forward direction and is connected in series with the first resistor R_1, the emitter of the second transistor (T_2) is connected to the first junction point (**1**) via at least one fourth transistor (T_4) of the first conductivity type arranged as a diode and poled in the forward direction, and the series arrangement of a fifth resistor (R_5) and a first semiconductor junction is arranged between the first and the third junction point (**3**).

4,446,420

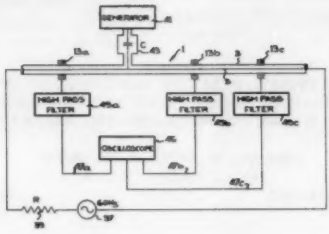
METHOD AND DEVICE FOR DETECTING AND LOCATING FAULT AND/OR PARTIAL DISCHARGES IN A GAS-INSULATED ELECTRICAL EQUIPMENT

Michel G. Drouet, St-Bruno, Canada, assignor to Hydro Quebec, Montreal, Canada

Filed Jan. 28, 1982, Ser. No. 461,870

Int. Cl.³ G01R *31/08*

U.S. Cl. 324—52 **15 Claims**



1. In a device for detecting and locating faults and partial discharges in a gas-insulated electrical equipment of the type comprising a closed wall housing containing an insulating gas for electrically insulating at least one conducting element centrally extending inside said housing, said device comprising:

a plurality of field coupled current sensors located at given intervals inside the housing for detecting any variation of the current flowing through the conducting element, each of said sensors giving a signal in correlation with said detected variation; and

a control circuit connected to each of the sensors for comparing their signals and measuring the time interval between all the signals given by the sensors of a given variation of current, and thereby determining where is located the fault and/or partial discharge causing said given variation of current

the improvement wherein:

each of said sensors comprises a toroidal helix pick up coil located in an annular cavity machined in the housing wall and extending all around the conducting element,

each of said annular cavities being connected along its entire length to the inner surface of the housing wall by a slit having opposed side walls sufficiently spaced apart to be insulated from each other.

4,446,421

APPARATUS AND METHOD FOR LOCATING FAULTS IN CABLES

Dennis W. Berde, Plainview, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,608

Int. Cl.³ G01R *31/08*

U.S. Cl. 324—52 **13 Claims**

1. An apparatus for locating a fault condition between first and second conductors disposed adjacent to one another, each conductor having a length L, said fault condition being a short or a high impedance leakage path between said conductors, comprising:

(a) means for grounding one end of said first conductor;

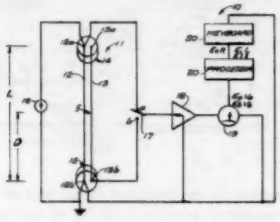
(b) means for applying a control signal to said first conductor such that a first voltage V_a exists between the ends of the first conductor, and thereupon a second voltage V_b exists between said second conductor and ground potential, there being a path to said second conductor through the fault condition;

(c) voltage detector means selectively connectable to the ends of said first conductor for providing a signal E_a which is representative of said first voltage V_a, said volt-

age detector means being further selectively connectable between said second conductor and ground potential for providing a signal E_b which is representative of said second voltage V_b;

(d) means for selectively connecting said voltage detector means to the ends of said first conductor and between said second conductor and ground potential;

(e) data input means for providing a signal E_L representative of the length L of said conductors; and



(f) processor means responsive to said voltage detector means and said data input means for processing said E_a, E_b and E_L signals to provide a signal E_D which is representative of the distance D between said fault condition and the grounded end of said first conductor said distance D being defined by the relationship:

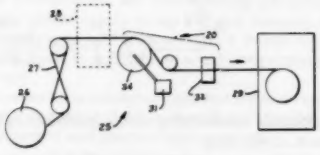
$$D=(V_b/V_a)L.$$

4,446,422

METHODS OF AND APPARATUS FOR DETECTING, MEASURING, AND CLASSIFYING INSULATION DEFECTS

Paul G. Koehler; Thomas P. Leahy, and Thomas P. Lichliter, all of Omaha, Nebr., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Nov. 24, 1981, Ser. No. 324,367
Int. Cl.³ G01R *31/12, 31/08*
U.S. Cl. 324—54 **20 Claims**



1. A method of detecting, measuring, and classifying defects in an insulation cover which encloses a metallic conductor, said method including the steps of:

advancing successive increments of the metallic conductor and its insulation cover along an axis past a probe;

generating a pulse train, the count of which is representative of the length of the conductor which is advanced past the probe;

impressing across the insulation cover a voltage having sufficient magnitude to cause electrical current to flow between the probe and the metallic conductor through an insulation defect, the current flow being initiated prior to and terminated subsequent to the defect being advanced past the probe;

counting a portion of the pulse train in response to current flow through the defect to provide a pulse count which is representative of the sum of a distance which is measured along the axis between points where the current flow is initiated and terminated and of the length of the defect;

subtracting a predetermined count from the pulse count to provide a corrected pulse count which is representative of the length of the defect, said predetermined count being representative of the distance between the points along the axis where the current flow is initiated and terminated to compensate for the current flow prior and subsequent to the defect being advanced past the probe; and

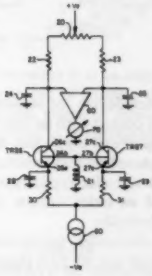
comparing the corrected pulse count to preset pulse counts which are proportional to defect length categories to classify the defect.

4,446,423

LINEAR SELF-EXCITED CAPACITANCE BRIDGE

Armik A. Hakhverdian, 1153 Janis Way, San Jose, Calif. 95125

Filed Sep. 29, 1982, Ser. No. 432,095
Int. Cl.³ G01R *27/26, 27/00*
U.S. Cl. 324—60 C **4 Claims**



1. An apparatus for comparing first and second capacitive elements, said apparatus comprising:

first and second semiconductor amplifying devices, each semiconductor device having an input terminal, a control terminal, and an output terminal;

an inductive element having a first terminal which is grounded and having a second terminal connected to said control terminals of said first and second semiconductor devices;

first and second reactive networks, respectively including said first and second capacitive elements and respectively connected to said input terminals of said first and second semiconductor devices;

a constant current source which is operatively electrically connected to said first and second reactive networks;

a resistive network having at least one adjustable resistance element, said resistive network operatively connected to said output terminals of said first and second semiconductor devices;

a measurement means operatively connected to said output terminals of said first and second semiconductor devices for measuring the relative voltage therebetween;

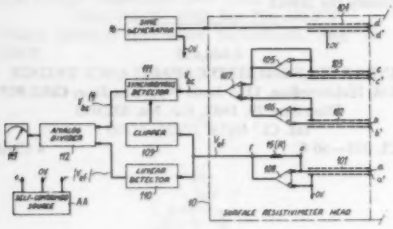
wherein the values of said resistance and reactive networks and inductive element and parameters of said semiconductor devices are selected such that said apparatus oscillates at a predetermined frequency;

and wherein if said adjustable resistive element of said resistive network is first adjusted so as to cause said measuring means to determine that the voltage between said output terminals of said first and second semiconductor devices has a zero DC value when said inductive element is shorted out with respect to an alternating current, then said measuring means indicates a zero value of potential difference across said output terminals of said first and second semiconductor devices when said first and second capacitive elements are equal in their capacitive value.

4,446,424
SURFACE RESISTIVIMETER

Michel J. Chatanier, Saint Maur; Michel J. Portat, Villebon sur Yvette, and Alain E. Bruere, Chevilly-Larue, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Sep. 15, 1981, Ser. No. 302,618
Claims priority, application France, Oct. 17, 1980, 80 22329
Int. Cl.³ G01R *27/02, 27/26*
U.S. Cl. 324—62 **3 Claims**



1. A resistivimeter device for measuring the surface resistance of a structure coated with an inner resistive layer and an outer insulating superficial layer, said device comprising:

a pick-up to be placed on said structure surface, formed of a central cylindrical electrode, two intermediary annular electrodes and an outer annular electrode coaxial with said central electrode;

annular arcing electrodes surrounding said intermediary electrodes except on the part thereof lying on the structure surface;

unit follower means bringing said arcing electrodes to a potential respectively equal to that of the surrounded intermediary electrodes;

annular sheathing electrodes surrounding said central and outer electrodes except on the part thereof lying on the structure surface, said sheathing electrodes being brought to a predetermined potential;

means for applying a supply alternating voltage between said central and outer electrodes, thereby producing a current between said electrodes;

means for applying said current to a load resistor and measuring the voltage across said load resistor;

means for measuring the inter-electrode voltage appearing between said intermediary electrodes;

means for forming the component of said inter-electrode voltage cophasal with said load resistor voltage; and

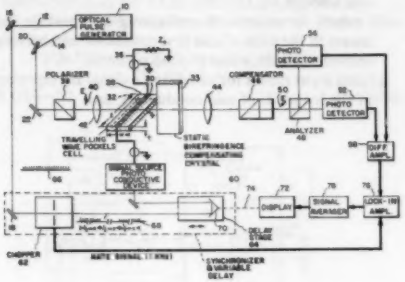
means for dividing said component voltage by said load resistor voltage.

4,446,425
MEASUREMENT OF ELECTRICAL SIGNALS WITH PICOSECOND RESOLUTION

Janis A. Valdmanis, Columbus, Ind., and Gerard Mourou, Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,127
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 K **22 Claims**

1. A system for measurement of an electrical signal with picosecond resolution which comprises means including a traveling wave Pockels cell for electrooptically sampling successively occurring portions of said signal with optical pulses which propagate through the cell transversely to the direction

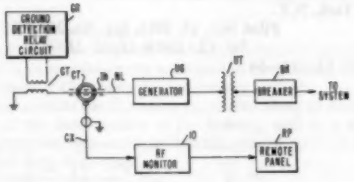


of the propagation of the electrical signal, and means for processing the samples to provide a display of said signal.

4,446,426
ON-LINE RF ARC MONITOR FOR LARGE ROTATING GENERATORS

Franklin T. Emery, Greentree, Pa.; Bruce N. Lenderking, Glen Burnie, Md., and Robert D. Couch, New Freedom, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1981, Ser. No. 318,225
Int. Cl.³ G01R *31/06, 31/02*
U.S. Cl. 324—158 MG **9 Claims**



1. Apparatus for detecting arcing conditions in an electrical generator, comprising,

first circuit means for monitoring the RF current present in the neutral grounding circuit of the generator and producing an RF level output indicative thereof, which first circuit means includes an RF frequency selector means for selecting a predetermined frequency component of the RF current present in the neutral grounding circuit of the generator, amplifier circuit means for amplifying the selected component of said RF current, and a peak detector circuit for supplying a peak RF level signal to said second circuit means corresponding to the peak level of the selected frequency component of the RF current present in the neutral grounding circuit of the generator,

second circuit means for comparing the RF level output of said first circuit means to a predetermined alarm level and producing an alarm indication output in the event the RF level exceeds the predetermined alarm level, and

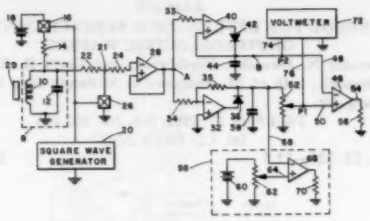
third circuit means for developing an indication of generator arcing conditions if the duration of said alarm indication output exceeds a predetermined time period.

4,446,427

MEASURING AND CONTROL DEVICE USING THE DAMPING EFFECT OF A RESISTIVE EFFECT ELEMENT ON THE INDUCTOR OF A TUNED CIRCUIT

Rodger T. Lovrenich, 209 Whispering Sands, Santa Teresa, N. Mex. 88063

Filed Mar. 23, 1981, Ser. No. 246,167
Int. Cl.³ G01B *7/00*; G01N *27/72*; G01R *33/12*
U.S. Cl. 324—207 **17 Claims**



1. A measuring and control device that measures or controls by detecting the energy absorbed by an energy absorbing resistive effect element in proximity to the magnetic field of an inductance means, comprising:

power supply means;

resonant circuit means including inductance means and capacitance means electrically coupled for oscillation and electrically connected to said power supply means;

detection and comparison circuit means electrically connected to said resonant circuit means for receiving an oscillating signal from said resonant circuit means when said resonant circuit means is oscillating and comparing the values of different parameters of the same oscillating signal to provide a ratio of said parameter values that indicates the damping effect upon said signal caused by the presence of said resistive effect element in the magnetic field of said inductance means for measurement and control purposes without using a separate reference value;

switching means electrically connected to said power supply means and said resonant circuit means for alternately completing the circuit between said resonant circuit means and said power supply means for energizing said resonant circuit means and then breaking the circuit between said power supply means and said resonant circuit means whereupon said resonant circuit means passes an oscillating signal to said detection and comparison circuit means; and

actuating means for actuating and deactuating said switching means at a frequency that is independent of the frequency of oscillation of said resonant circuit means.

4,446,428

MAGNETIC RESONANCE CELL

Tae M. Kwon, Thousand Oaks, and Charles H. Volk, Newbury Park, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 2, 1981, Ser. No. 307,996
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—304 **44 Claims**

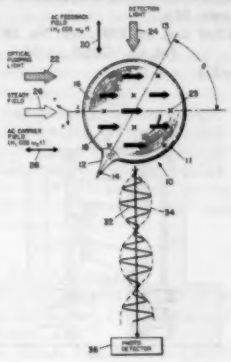
1. A nuclear magnetic moment alignment device comprising:

(a) a container for gas, said container having its inner surface substantially rotationally symmetric about an axis of symmetry;

(b) means for applying a steady magnetic field to said container;

(c) at least one nuclear magnetic moment gas selected from the group consisting of xenon-131, neon-21, krypton-85, and krypton-83, said magnetic moment gas being capable of being aligned in a predetermined direction to said magnetic field, said gas being enclosed in said container;

(d) means for orienting said container so that said axis of



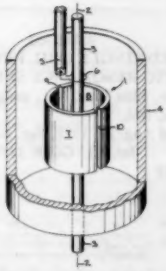
symmetry of said container is at an angle to said magnetic field so as to be capable of causing the relaxation time constant of the nuclear magnetic moment of said at least one nuclear moment gas to be substantially at a maximum.

4,446,429

MICROWAVE RESONATOR

Wojciech Froncisz, Cracow, Poland, and James S. Hyde, Dousman, Wis., assignors to Medical College of Wisconsin, Milwaukee, Wis.

Filed Oct. 9, 1981, Ser. No. 310,231
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—316 **14 Claims**



1. A lumped circuit resonator for gyromagnetic resonance spectrometers which comprises:

a loop formed from an electrically conductive material and being disposed around a central longitudinal axis, said loop having a length in the direction of the central longitudinal axis;

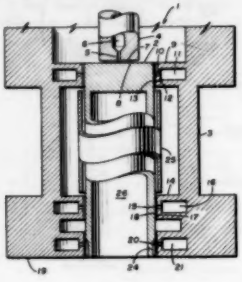
a plurality of gaps formed along the length of the loop to divide the loop into a plurality of separate pieces, wherein the number and size of the gaps are selected to tune the resonator to a desired resonant frequency; and

wherein electromagnetic energy is coupled to the lumped circuit resonator and a magnetic field is produced along the central longitudinal axis of the loop at the resonant frequency and is applied to a sample to be investigated.

4,446,430
SAMPLE SPINNER FOR NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Edward O. Stejskal, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 31, 1981, Ser. No. 297,594
Int. Cl.³ G01R 33/08
U.S. Cl. 324—321 10 Claims

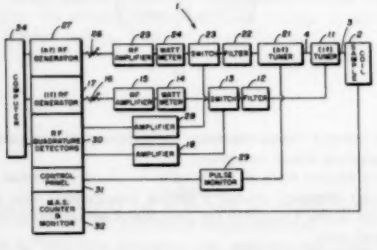


1. A NMR spectrometer sample spinner comprising a stator and a gas-driven rotor having a center cavity adapted to hold a sample, which stator and rotor contain a gas turbine portion, support gas bearing portions, and a thrust gas bearing portion, said stator having a chamber to accommodate the rotor and gas-carrying channels for feeding gas to the gas turbine portion, the support gas bearing portions and thrust gas bearing portion, said rotor comprising a cylindrical body which operatively fits the stator chamber and contains a plurality of flutes radially positioned around the outside surface of the body opposite the turbine drive gas channel of the stator, which rotor is supported at both ends by support gas bearings and is positioned by a thrust gas bearing, in which the thrust gas bearing comprises a gas stream fed through an orifice impinging against the end of the rotor, providing a space between the stator and rotor and holding the rotor in place whether spinning or motionless.

4,446,431
DOUBLE-TUNED SINGLE COIL PROBE FOR NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Robert A. McKay, Ellis Ville, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 24, 1981, Ser. No. 295,940
Int. Cl.³ G01R 33/08
U.S. Cl. 324—318 8 Claims

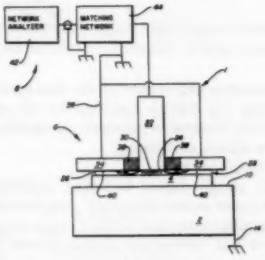


1. A double-tuned single coil probe for a nuclear magnetic resonance (NMR) spectrometer which probe comprises a sample coil connected to a double-tuned circuit means comprising a high frequency irradiation means and a low frequency irradiation means in which the two frequencies have a ratio of about at least three to one or more and are in the radio frequency (RF) range, in which the high frequency irradiation means is connected to the sample coil through a transmission line means comprising a transmission line of a length of about one half of the high frequency wavelength, and the low frequency irradiation means is connected to the sample coil through the aforesaid transmission line means through an inductor means connected to the transmission line at the point of about minimum impedance for the high frequency radiation.

4,446,432
METHOD FOR DETERMINING SURFACE CONTOUR OF PIEZOELECTRIC WAFERS

Lawrence N. Dworsky, Northbrook, and Garth R. Kennedy, Hinsdale, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 27, 1982, Ser. No. 382,425
Int. Cl.³ G01N 27/00
U.S. Cl. 324—71.5 2 Claims



1. A method of determining the radius of curvature, R, of the surface contour of a convex wafer of piezoelectric material, comprising:

applying a localized electrical field to an arbitrary location on a face of the wafer while monitoring the frequency response to determine the Oth order frequency of the wafer;

traversing the face of the wafer with said localized electrical field while monitoring the amplitude of the response at said Oth frequency until the location of maximum amplitude is found, said location corresponding to the point of maximum thickness, $2h_o$, of said wafer;

moving said localized electrical field from said location of maximum thickness along one of the planar axes of the wafer until an amplitude peak for the next mode is obtained, measuring the distance traversed, a, and solving the following equation for β:

$$0 = \frac{d}{d\beta}\left[(e^{-\beta a^2/2})\,(2\beta^1 a)\right],$$

and using the value obtained for β to solve one of the following equations for R:

$$\beta_N^2 = \frac{N^2\pi^2\overline{C}_{66}}{8Rh_o^3C_{55}}, \text{ if the field is moved along the } z \text{ axis, or}$$

$$\beta_N^2 = \frac{N^2\pi^2\overline{C}_{66}}{8Rh_o^3C_{11}}, \text{ if the field is moved along the } x \text{ axis,}$$

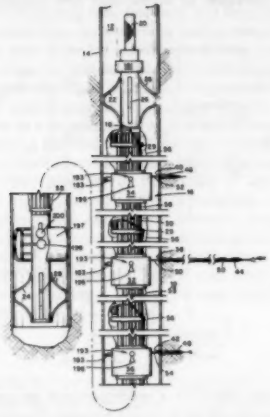
where N is the mode along the y thickness axis, $\overline{C}_{66}=C_{66}+e_{26}^2/\epsilon_{22}$ where C_{66} is an elastic coefficient of the piezoelectric material, e_{26} is a piezoelectric coupling coefficient and ϵ_{22} is a dielectric constant of the piezoelectric material in the thickness direction of the wafer, and C_{11}, C_{55} are elastic coefficients of the piezoelectric material.

4,446,433

APPARATUS AND METHOD FOR DETERMINING DIRECTIONAL CHARACTERISTICS OF FRACTURE SYSTEMS IN SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck, 401 Highview Pl., Morgantown, W. Va. 26505

Filed Jun. 11, 1981, Ser. No. 272,683
Int. Cl.³ G01V *3/30*; H01Q *1/04*
U.S. Cl. 324—338 **18 Claims**



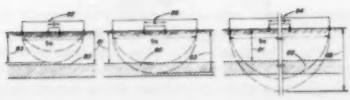
1. An apparatus for determining the directional and length characteristics of a natural or hydraulically induced fracture in a subterranean earth formation penetrated by a wellbore in registry with said fracture, comprising signal transmitting means including extendable antenna means, means for movably supporting the signal transmitting means in the wellbore at a location contiguous to said fracture, drive means supported by the signal transmitting means and coupled to the antenna means for extending the antenna means from said wellbore into the fracture, signal-receiving means oriented in the wellbore, means for movably supporting the signal-receiving means in the wellbore, and said signal-receiving means having antenna means disposed in a signal-receiving location with respect to said earth formation for receiving a signal from said antenna means within said fracture.

4,446,434

HYDROCARBON PROSPECTING METHOD WITH CHANGING OF ELECTRODE SPACING FOR THE INDIRECT DETECTION OF HYDROCARBON RESERVOIRS

Ben K. Sternberg; Dale E. Miller, and Dhari S. Bahjat, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 971,177, Dec. 20, 1978, Pat. No. 4,295,096. This application Mar. 20, 1981, Ser. No. 245,780
Int. Cl.³ G01V *3/06*
U.S. Cl. 324—363 **8 Claims**



1. A method of electrical hydrocarbon prospecting over an area on the surface of the earth to locate a subsurface polarizable stratum which is indicative of the presence of a hydrocarbon deposit lower than said stratum comprising:

(a) placing a first set of electrode means in the surface of the earth and having a preselected spacing, "a";

(b) placing a second set of electrode means in the surface of the earth having a spacing M (a) in line and symmetrically placed on each side of said first electrode means, where M is a constant;

(c) determining the presence of an electrical anomaly indication that is identifiable with said polarizable stratum;

(d) changing the spacing of said first and second electrode means in like proportion repeatedly while effecting step (c) for each said spacing to determine that spacing yielding a maximum value for said electrical anomaly; and

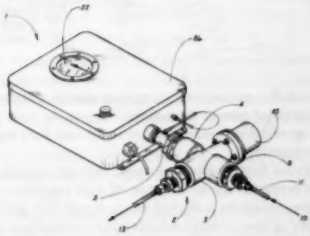
(e) proceeding with the electrical prospecting over said area on the surface of the earth using said spacing yielding said maximum value to determine the areal extent of said subsurface polarizable stratum.

4,446,435

ULTRASONIC STREAMING CURRENT DETECTOR

Anthony S. Canzoneri, Kenner, La., assignor to Process Development, Inc., Kenner, La.

Filed May 6, 1982, Ser. No. 375,577
Int. Cl.³ G01N *27/60*
U.S. Cl. 324—453 **18 Claims**



1. An ultrasonic streaming current detector apparatus for determining a function of a charge condition present in a system containing fluid with charge-influencing species, comprising:

a. a cross-shaped tubular member having cross-member and longitudinal elements adapted to being substantially filled with said fluid;

b. a piston receiving member being longitudinally coaxial with said longitudinal element;

c. a casing substantially surround said piston receiving member;

d. a pair of electrodes, the first electrode being disposed adjacent the bottom end of said piston receiving member and the second electrode being disposed in said piston receiving member above the first electrode;

e. a reciprocating piston element disposed in a central bore of said piston receiving member and said casing;

f. means for reciprocating said reciprocating element within the bore of said piston receiving member, so as to cause said fluid to flow to and from said bore, in a continuous, repetitive manner thereby generating electrical signals across said electrodes;

g. means for amplifying electrical signals generated across said electrodes, and means for utilizing said amplified signals;

h. means for conducting said electrical signals generated across said electrodes from said electrodes to said means for amplifying said electrical signals and said means for utilizing said amplified signals;

i. means for synchronizing said conduction of said electrical signals with the action of said reciprocating piston element;

j. an ultrasonic cleaning device disposed adjacent to said piston receiving member and said casing for generating

mechanical vibrations to prevent agglomeration of said charge-influencing species contained by said liquid in the area about said electrodes.

4,446,436

CIRCUIT FOR GENERATING ANALOG SIGNALS

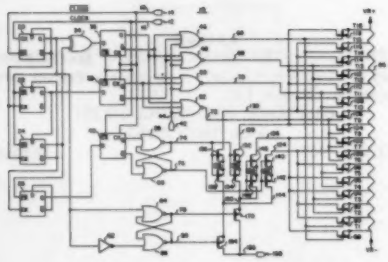
Jeffrey R. Ireland, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US81/00700, 371 Date May 18, 1981, 102(e) Date May 18, 1981, PCT Pub. No. WO82/04168, PCT Pub. Date Nov. 25, 1982

PCT Filed May 18, 1981, Ser. No. 278,906

Int. Cl.[3] **H03K** *4/02, 6/00, 13/02*

U.S. Cl. 328—14 **6 Claims**



1. A circuit for producing an analog signal, comprising:

first and second power terminals;

a multi-tap resistor connected between said first and second power terminals;

a plurality of first switches formed into plural groups connected respectively to the taps of said resistor;

means responsive to a digital input signal for generating a plurality of first control signals each controlling a separate group of said first switches;

a plurality of second switches each connected to a plurality of said first switches wherein each second switch is connected to no more than one of said first switches within each of said groups of first switches, and each first switch is connected to no more than one of said second switches;

means responsive to said digital input signal for generating a plurality of second control signals each controlling a separate group of said second switches;

a plurality of third switches each connected to a plurality of said second switches and to an output terminal wherein each third switch is connected to no more than one of said second switches within each of said groups of second switches and each second switch is connected to no more than one of said third switches; and

means responsive to said digital input signal for generating a plurality of third control signals for controlling said third switches wherein the operation of said third switches connects said taps one at a time to said output terminal to produce said analog signal of said output terminal.

4,446,437

PULSE MONITOR CIRCUIT

Gerald M. Rinaldi, Mundelein, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 21, 1981, Ser. No. 333,220

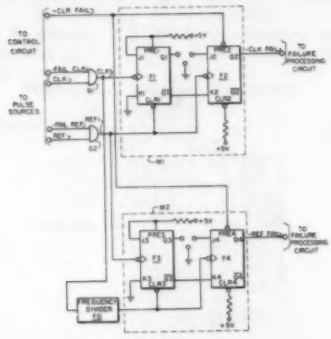
Int. Cl.[3] **H03K** *5/19, 5/26*

U.S. Cl. 328—120 **14 Claims**

1. A pulse monitor circuit for use in a switching system, including a reference signal source which is normally operated to provide reference signal pulses of first and second polarities and of a first frequency, said reference signal source being abnormally operated to inhibit said reference signal pulses, and a clock signal source which is normally operated to provide clock signal pulses of first and second polarities and of a second frequency, said clock signal sources being abnormally operated to inhibit said clock signal pulses, said pulse monitor circuit comprising:

clock monitor means connected to said clock signal source and said reference signal source, operated in response to a reference signal pulse of said first polarity and an absence of a clock signal pulse to provide a clock failure signal;

frequency division means, connected to said clock signal source, operated to divide said first frequency of said



clock signal pulses by a predetermined amount, whereby said frequency division means provides frequency divided clock signal pulses having first and second polarities and a third frequency less than said first frequency of said reference signal; and

reference monitor means, connected to said reference signal source and said frequency division means, operated in response to a frequency divided clock signal pulse of said first polarity and an absence of a reference signal pulse to provide a reference failure signal.

4,446,438

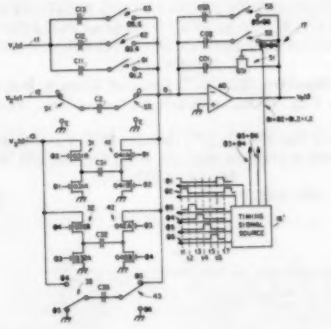
SWITCHED CAPACITOR N-PATH FILTER

Chieh Chang, Belmont, and Man S. Lee, San Mateo, both of Calif., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Oct. 26, 1981, Ser. No. 314,827

Int. Cl.[3] **G06G** *7/18;* **H03K** *5/00;* **H03B** *1/00*

U.S. Cl. 328—127 **5 Claims**



1. In an N-path filter, a commutating switched capacitor integrator circuit comprising:

an active element having a first input terminal and an output terminal;

a first plurality of N capacitors each having the same value of capacitance;

first switch means selectively-sequentially connecting, at a commutating rate, individual ones of said first plurality of capacitors as integrating capacitors between said active elements' first input and output terminals only during associated pairs of adjacent time slots for storing charge; and

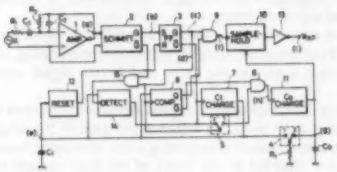
connecting means for selectively-sequentially connection at least one of: (1) individual ones of a second plurality of N-capacitors each having the same values of capacitance, at the commutating rate, between said first input terminal and a second input terminal only during associated pairs of adjacent time slots for selectively storing charge for an input voltage on said second input terminal; and (2) individual ones of a third plurality of capacitors of the same value of capacitance during associated pairs of adjacent time slots in a manner so as to alternately connect, at the commutating rate and during first and second time slots of each pair thereof, one and other sides of an individual one of said third plurality of capacitors to said first input terminal and a ground reference potential, respectively, and to ground and a third input terminal, respectively for alternately transferring charge between associated ones of said first and third pluralities of capacitors and storing charge on the associated one of said third plurality of capacitors for an input voltage on said third input terminal, respectively.

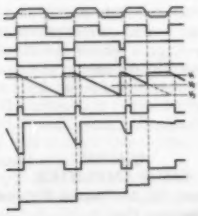
4,446,439

FREQUENCY/VOLTAGE CONVERSION CIRCUIT

Kastuji Mizumoto, and Katsuhiko Yaguchi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,130
Claims priority, application Japan, Mar. 13, 1981, 56-36964
Int. Cl.³ H03K 9/06
U.S. Cl. 328—140 **9 Claims**





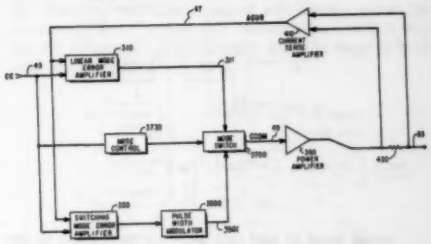
1. A frequency/voltage conversion circuit, comprising; a pulse generation circuit for generating a pulse signal having a period in accordance with a frequency of a given signal; a Flip-Flop being set by said pulse signal; a first charging/discharging circuit which discharges while said Flip-Flop is set, and which charges in response to a control signal; means for providing said control signal to said first charging/discharging circuit when said Flip-Flop is reset; means for resetting said Flip-Flop; and a detecting circuit for monitoring the charge level of said first charging/discharging circuit and for outputting a detection signal when the charge level of said first charging/discharging circuit does not reach a predetermined reference level at a predetermined time in each period of said pulse signal; means for providing said control signal in response to said detection signal, whereby said first charging/discharging circuit is forcedly charged in response to said detection signal.

4,446,440

DUAL MODE AMPLIFIER

R. Frank Bell, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 26, 1982, Ser. No. 342,942
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 **8 Claims**



1. In an electrical circuit for amplifying an electrical signal received at an input node the combination comprising:

a first amplifier means coupled to said input node for amplifying said electrical signal and providing a first output signal;

a second amplifier means coupled to said input node for amplifying said electrical signal and providing a second output signal;

a mode selector means coupled to the first amplifier means and to the second amplifier means and to said input node responsive to said electrical signal to provide a power input signal selected from said first and second output signals;

a power amplifier means which operates in two modes coupled to the mode selector means and responsive to said power input signal, said power amplifier operating in a linear mode when the power input signal is said first output signal and in a switching mode when the power input signal is said second output signal.

4,446,441

TRANSIENT NOISE FREE TYPE AMPLIFIER CIRCUIT

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,698
Claims priority, application Japan, Sep. 22, 1980, 55-135035
Int. Cl.³ H03F 1/26, 3/30
U.S. Cl. 330—149 **9 Claims**

1. A transient noise free amplifier circuit, comprising:

(a) first amplifier means having a noninverted input and a bias input, for receiving an input signal at the noninverted input and for supplying a first output signal corresponding to said input signal;

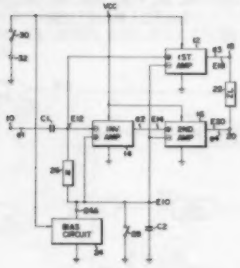
(b) inverter means having an inverted input and a bias input, for receiving said input signal at the inverted input and for phase-inverting said input signal to generate an inverted signal;

(c) second amplifier means having a noninverted input and a bias input, for receiving said inverted signal at the noninverted input and for supplying a second output signal corresponding to said inverted signal, said second output signal having an antiphase relation to said first output signal wherein said first and said second amplifier means perform a balanced transformerless amplifier operation;

(d) bias means having a bias terminal for generating a first bias potential at said bias terminal and for applying said first bias potential to the bias input of each of said first amplifier means, said second amplifier means, and said inverter means, wherein said first bias potential determines an operational bias of said first amplifier means, said second amplifier means and said inverter means;

(e) bias transfer means for transferring said first bias potential from the bias terminal of said bias means to the noninverted input of said first amplifier means and to the inverted input of said inverter means, so that said first amplifier means and said inverter means each receive a second bias potential corresponding to said first bias potential; and

(f) output means coupled to said first and said second amplifier means, for providing an output signal corresponding to a potential difference between said first and said second output signals.

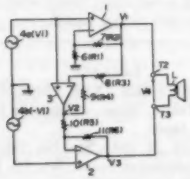


4,446,442

AMPLIFIER CIRCUIT

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1981, Ser. No. 308,578
Claims priority, application Japan, Nov. 19, 1980, 55-162884
Int. Cl.³ H03F *1/26, 1/34*
U.S. Cl. 330—149 **9 Claims**



1. An amplifier circuit comprising:

a first amplifier being supplied with an input signal from a signal source and amplifying the input signal to develop at an output thereof an output signal;

a second amplifier being supplied with the input signal from said input signal source and amplifying the input signal to develop at an output thereof an output signal having an opposite phase to the output signal of the first amplifier;

a load connected between the outputs of the first and second amplifiers; and

distortion detecting circuit means for detecting the distortion generated in said first amplifier and applying a detected distortion signal to said second amplifier;

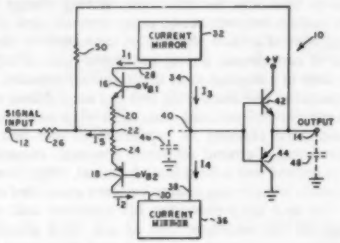
the output of said second amplifier having a distortion with a same amplitude and phase as the distortion appearing at the output of said first amplifier.

4,446,443

AMPLIFIER HAVING REDUCED POWER DISSIPATION AND IMPROVED SLEW RATE

Fred D. Johnson, Evanston; Michael D. Flasza, Schaumburg, and George J. Tzakis, Glenview, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 232,783, Feb. 9, 1981, abandoned. This application May 20, 1982, Ser. No. 379,838
Int. Cl.³ H03F *3/45, 3/26;* H04N *5/44*
U.S. Cl. 330—257 **12 Claims**



1. An amplifier comprising:

first circuit means receiving an input signal for generating a first signal current whose amplitude increases in response to input signal transitions of a given direction, and for generating a second signal current whose amplitude decreases in response to the same input signal transitions;

second circuit means comprising a first current mirror having an input and an output, wherein the input of the first current mirror receives the first signal current for establishing a third signal current in the output thereof which mirrors the first signal current;

a second current mirror receiving the second signal current for generating a fourth signal current which mirrors the second signal current;

an output stage receiving the third and fourth signal currents for developing an output signal corresponding to the difference between the third and fourth signal currents; and

a negative feedback path coupled between the input signal and the output signal to stabilize the gain of the amplifier;

said first circuit means comprising a first transistor having its collector coupled to the input of the first current mirror and its base coupled to a bias voltage, a first resistor coupled between a common node and the emitter of the first transistor, a second transistor having its collector coupled to an input of the second current mirror and its base coupled to a bias voltage, a second resistor coupled between the common node and the emitter of the second transistor and means for coupling the input signal to said common node.

4,446,444

CMOS AMPLIFIER

Raymond B. Patterson, III, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 5, 1981, Ser. No. 231,672
Int. Cl.³ H03F *3/18, 3/16*
U.S. Cl. 330—264 **10 Claims**

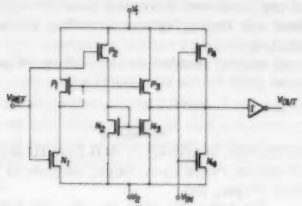
1. An amplifier circuit having a signal input terminal, a reference terminal and a signal output terminal comprising:

a complementary field effect transistor inverter having an N and P channel device connected between a pair of supply terminals with the input terminal of the circuit being the input of said inverter and the output terminal of said circuit being the output of said inverter;

a first complementary field effect transistor current mirror means connected between said pair of supply terminals and including an N channel device having its source-drain

path connected in a controlling leg and said reference terminal being connected to its gate and said inverter N channel device having its source-drain path connected in a controlled leg of said first current mirror means; and

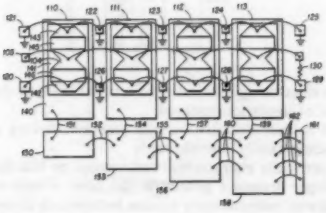
a second complementary field effect transistor current mirror connected between said pair of supply terminals and including a P channel device having its source-drain path connected in a controlling leg and said reference terminal being connected to its gate and said inverter P channel device having its source-drain path connected in a controlled leg of said second current mirror means.



4,446,445
SINGLY TERMINATED PUSH-PULL DISTRIBUTED AMPLIFIER

Thomas R. Apel, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 24, 1982, Ser. No. 444,283
Int. Cl.³ H03F 3/60
U.S. Cl. 330—269 **13 Claims**



1. A push-pull distributed amplifier having a singly terminated output comprising:

a. an integrated circuit substrate;

b. a plurality of active amplifier devices mounted on said substrate in two related sections, each section having electrical interconnection of that sections active amplifier devices, each to the others, to form a distributed amplifier; and having said sections interconnected to form a push-pull distributed amplifier; and

c. said electrical interconnection within said section having a reactance difference between said active devices resulting in substantially all of the amplifier power being output to said singly terminated output.

4,446,446
PROGRAMMABLE FREQUENCY SYNTHESIZER PRIMARILY FOR USE IN AN ATOMIC CLOCK

William R. Fowks, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

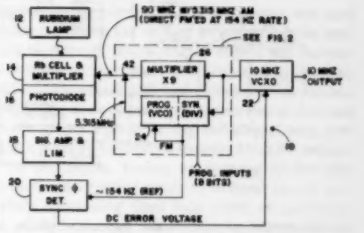
Filed Jul. 17, 1981, Ser. No. 284,039
Int. Cl.³ H03L 7/18, 7/26
U.S. Cl. 331—3 **20 Claims**

1. An adjustable frequency synthesizer for receiving an input signal of a first frequency and for generating a carrier signal of a second frequency, the second frequency being offset from the first frequency by a selected offset frequency, comprising:

a programmable frequency divider having an input for receiving a signal derived from said input signal and operating therefrom a first divided signal having a frequency equal to said first frequency divided by a number selected in accordance with a programmed code applied to said programmable frequency divider,

a phase comparator connected to said programmable frequency divider for receiving said first divided signal, said phase comparator having means for comparing the frequency and phase of said first divided signal with the frequency and phase of a second divided signal and for generating a control signal by means of said comparing,

a controllable oscillator connected to said phase comparator for receiving said control signal and having means for generating at an output said carrier signal with a frequency determined in accordance with the magnitude of said control signal,



a mixer connected to the input of said programmable frequency divider and to the output of said controllable oscillator for receiving said signal derived from said input signal and at least said carrier signal, said mixer having means for generating a difference signal having a frequency equal to said selected offset frequency,

a fixed frequency divider connected to said mixer for receiving said difference signal and having means for generating said second divided signal with a frequency equal to said offset frequency divided by a fixed number, said fixed frequency divider including means for generating a third divided signal having a frequency equal to one half of the frequency of said second divided signal, said fixed frequency divider being connected to said phase comparator for applying said second divided signal to said phase comparator, and said fixed frequency divider being connected to said controllable oscillator for frequency modulating said carrier signal with said third divided signal,

whereby said offset frequency is selected in accordance with and controlled by said programmed code.

4,446,447
CIRCUIT FOR CONVERTING PRESSURE VARIATION TO FREQUENCY VARIATION

David A. McNamara, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 219,083, Dec. 22, 1980, abandoned.
This application Feb. 25, 1983, Ser. No. 469,666
Int. Cl.³ G01L 9/12; H03B 21/01
U.S. Cl. 331—42 **7 Claims**

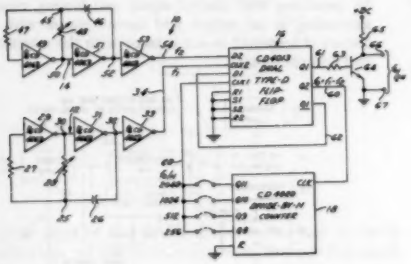
1. A transducer for converting a pressure variation to a variation in the frequency of a periodic function, said transducer comprising:

a reference oscillator means having a reference timing capacitor and a reference resistor for providing a reference periodic electrical signal having a frequency which is a function of the capacitance and resistance, respectively, of said reference timing capacitor and said reference resistor such that the frequency is inversely proportional to the

magnitude of the capacitance of the reference timing capacitor;

a sensor oscillator means having a variable sensor timing capacitor and a sensor resistor for providing a sensor periodic electrical signal having a frequency which is a function of the capacitance and resistance, respectively of said variable sensor timing capacitor and said sensor resistor such that the frequency is inversely proportional to the magnitude of the capacitance of the sensor timing capacitor so as to provide a linear transfer function between pressure input and frequency output;

said sensor timing capacitor being a type of capacitor wherein the capacitance change is produced by the displacement of one of the capacitor plates such that the capacitance is inversely proportional to pressure;



a digital mixer means responsive to said reference and sensor electrical signals for generating a mixed periodic electrical signal having a frequency proportional to the difference between said reference and sensor electrical signals;

a frequency divider means coupled to said digital mixer means, between an input and an output to said digital mixer means, for reducing substantially all harmonic frequencies introduced by said mixer; and

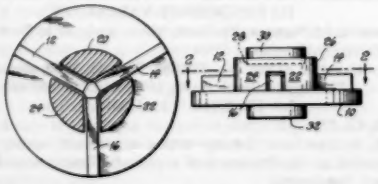
said transducer having a transfer function relating pressure and frequency which is substantially linear and adjustable by adjustment of the magnitude of said reference and sensor resistors.

4,446,448

BIASING MAGNET HOLDER-TUNING CAP FOR DIELECTRIC WAVEGUIDE CIRCULATOR

Richard A. Stern, Allenwood, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 13, 1982, Ser. No. 407,869
Int. Cl.³ H01P *1/383*
U.S. Cl. 333—1.1 **8 Claims**



1. A millimeter wavelength dielectric waveguide circulator comprising:

a dielectric support plate;

a ferrite junction having a plurality of sides with its bottom bonded to said support plate;

a plurality of dielectric waveguides bonded to said support plate;

each of said dielectric waveguides having one end bonded to a side of said ferrite junction;

at least one metal tuning leg positioned between but spaced from two adjacent dielectric waveguides;

a metal cap positioned above said junction supported by said at least one tuning leg and providing support for a first magnet; and

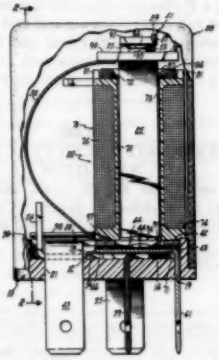
a second magnet bonded to the bottom of said dielectric support plate below said junction.

4,446,449

ELECTROMAGNETIC SOLENOID RELAY

Samuel J. Brown, South Lyon, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 22, 1982, Ser. No. 436,120
Int. Cl.³ H01H *51/08*
U.S. Cl. 335—131 **9 Claims**



1. An electromagnetic solenoid relay of the type comprising:

a base of insulation material;

a coil bobbin mounted on said base and having a bore extending axially therethrough;

an electrically energizeable coil wound on said bobbin;

a plunger armature guided in the bore of said bobbin for endwise reciprocatory motion between an at-rest position and an actuated position upon the energization and de-energization of said coil;

a substantially U-shaped ferromagnetic bracket embracing said coil bobbin and secured to said base, said bracket having a pair of parallel leg portions extending from said base alongside said bobbin and joined by a bight portion overlying one end of said bobbin, said bight portion having an opening therethrough in alignment with the bore of said bobbin through which an outer portion of said plunger projects;

an electrical terminal of a ferromagnetic material mounted on said base intermediate the free ends of said leg portions of said bracket beneath the other end of said bobbin for attraction of said armature endwise to its actuated position in response to the energization of said coil; and

a resilient spring for urging said armature to its at-rest position, said spring comprising a continuous length of spring strip metal and having an arcuate portion extending between one end secured to said outer portion of said armature and an opposite end fixed relative to said base, said electromagnetic solenoid relay being further characterized by the following:

said opening in said bight portion of said bracket being substantially larger than the portion of said armature projecting therethrough;

said outer portion of said armature including a flange of

ferromagnetic material which has a surface of substantial area facing said bight portion of said bracket to provide a low reluctance magnetic flux path between said armature and said bight portion for attraction of said flange to said bight portion in a direction endwise of said armature in response to the energization of said coil;

the length of said armature being such that said flange comes into contiguous but not contacting relation with said bight portion upon movement of said armature to its actuated position; and

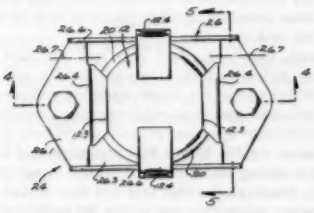
an armature stop secured to said bracket and engagable by means on said outer portion of said armature to define an at-rest position of said armature wherein said flange is spaced a predetermined distance from said bight portion.

4,446,450

THERMOSTAT DEVICE HAVING IMPROVED MOUNTING MEANS

Henry J. Boulanger, Nicolasville, Ky.; Andrew C. McGuirk, North Attleboro, and William J. LaPlante, Rehoboth, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1982, Ser. No. 449,942
Int. Cl.³ H01H 37/04
U.S. Cl. 337—380 **3 Claims**



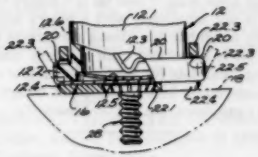
1. A thermostat device comprising a thermostat unit and bracket means for mounting the unit on an object whose temperature is to be monitored, characterized in that the thermostat unit has a generally cylindrical configuration, has a first surface at one end of the unit to be disposed in thermally-coupled heat-transfer relation to said object, and has a second surface extending around the circumference of the unit facing in an opposite direction, and in that the bracket means comprises a plate having a base portion extending in a plane, has stud means secured to said base portion to extend in one direction from the base portion for securing the base portion in thermally-coupled heat-transfer relation to said object, and has a pair of integral spring portions extending in an opposite direction from respective opposite sides of the base portion, the spring portions each having an opening therein fitted over a portion of the thermostat unit between said first and second surface portion and having a marginal part of said opening engaging a second surface portion of the unit for attaching the bracket means to the thermostat unit and for resiliently biasing said first thermostat unit surface against said base portion to be disposed in thermally-coupled heat-transfer relation to said object.

4,446,451

THERMOSTAT DEVICE HAVING IMPROVED MOUNTING MEANS

Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1982, Ser. No. 449,943
Int. Cl.³ N01H 37/04
U.S. Cl. 337—380 **5 Claims**



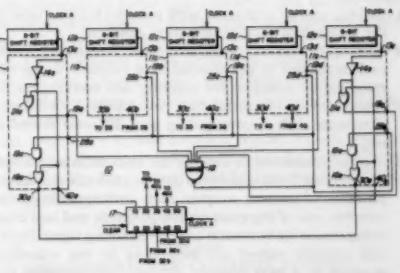
1. A thermostat device comprising a thermostat unit and bracket means for mounting the unit on an object whose temperature is to be monitored, characterized in that the thermostat unit has a first surface preferred to be disposed in thermally-coupled heat-transfer relation to said object and has second surface portions facing in an opposite direction, and in that said bracket means comprises a plate having an integral base portion extending in a plane to be secured to said object for mounting the plate on the object, having an opening in the base portion of the plate, and having a pair of integral spring portions of the plate upstanding from said plane at respective opposite sides of said opening, said spring portions having distal ends thereof folded to extend toward each other and back toward said plane to engage said second surface portions of the thermostat unit for detachably attaching the bracket means to the thermostat unit and for biasing said thermostat unit towards said object so that said first surface thereof extends through said base plate opening into thermally-coupled heat-transfer relation to the object, thereby to maintain desired thermal coupling of said first unit surface to the object during thermal expansion and contraction thereof.

4,446,452

MAGNITUDE COMPARATOR CIRCUIT AND METHOD

Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 13, 1981, Ser. No. 292,497
Claims priority, application Canada, Jun. 23, 1981, 380396
Int. Cl.³ G06F 7/02
U.S. Cl. 340—146.2 **11 Claims**



1. A circuit for determining which serially received binary number, out of a plurality of binary numbers received bit-serially in parallel, has the largest magnitude, said circuit comprising:

a storage means having at least a one bit location corresponding to each said binary number; and

gating means, for each said number, for storing in a respective one of said locations in said storage means, in response to each bit of said number,

(a) the previous logic state stored in said location if said bit is a binary 1, or

(b) a first logic state if said bit is a binary 0 and is associated with a binary number that is a remaining candidate for having the largest magnitude and the corresponding bits of the other binary numbers, remaining candidates, are also binary 0's, or

(c) a second logic state if said bit is a binary 0 and either (i) said bit is not associated with a binary number that is a remaining candidate for having the largest magnitude, or (ii) said bit is associated with a binary number that is a remaining candidate for having the largest magnitude but the corresponding bits of the other binary numbers, remaining candidates, are not all binary 0's.

4,446,453

METHOD FOR THE REGISTRATION AND EVALUATION OF DENTAL FINDINGS AS WELL AS AN APPARATUS FOR THE IMPLEMENTATION OF THE METHOD

Algund Eenboom, Leer, and Edzard Müller, Hinte, both of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

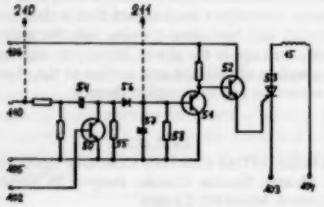
PCT No. PCT/DE80/00105, 371 Date Mar. 18, 1981, 102(e) Date Mar. 18, 1981, PCT Pub. No. WO81/00201, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 23, 1980, Ser. No. 247,301

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930142

Int. Cl.[3] **G09G** *3/00*

U.S. Cl. 340—286 M **15 Claims**



1. An apparatus for recording and evaluating a number of dental findings each corresponding to a respective one of a given number of dental examination positions, said apparatus comprising:

a marking carrier imprinted with a dental scheme indicating the location of each examination position;

a marking device including a number of marking elements each arranged to correspond to a respective one of the examination positions for marking said marking carrier;

an input device for producing two different switching instructions each corresponding to a different dental finding;

a counter connected to receive the two different switching instructions from said input device, said counter having a plurality of counter outputs each corresponding to a respective one of the examination positions and said counter being operative to switch over an enabling signal from one said counter output corresponding to one examination position to a next counter output corresponding to the next examination position in the dental scheme upon receipt by said counter of either of said two different switching instructions;

a plurality of switching amplifiers each connecting a respective one of said counter outputs to a respective one of said marking elements corresponding to the same examination position as said respective counter output, wherein the switch over of the enabling signal to said next counter output enables the switching amplifier corresponding to the examination position associated with said next counter output, and each said switching amplifier includes exciting means responsive to said input device for causing that switching amplifier, when enabled by said counter, to excite the corresponding marking element unless a given one of said two different switching instructions is produced by said input device.

4,446,454

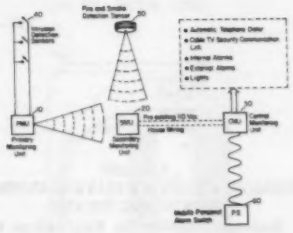
HOME SECURITY SYSTEM

Ronald E. Pyle, 13400 Wisterwood, Austin, Tex. 78729

Filed Jan. 21, 1981, Ser. No. 226,626

Int. Cl.[3] **G08B** *1/08;* **H04Q** *1/30*

U.S. Cl. 340—538 **5 Claims**



1. A security system for a home having at least one entry point and pre-existing electrical wiring for distributing electrical power therein, the system comprising:

an intrusion detection sensor proximate said entry point, for sensing an intrusion at said entry point and providing an intrusion detection signal in electrical form in response to sensing said intrusion;

a primary monitoring unit near said intrusion detection sensor and electrically coupled thereto, and including means for selectively deactivating said primary monitoring unit, said primary monitoring unit receiving said intrusion detection signal and providing a primary alarm signal in human audible form a first predetermined time period after receiving said intrusion detection signal unless selectively deactivated within said first time period;

a secondary monitoring unit within the audible range of the primary monitoring unit and electrically coupled to said wiring, and including means for selectively deactivating said secondary monitoring unit, said secondary monitoring unit detecting said primary alarm signal and providing an alarm detection signal in electrical form via said wiring a second predetermined time period after detecting said primary alarm signal unless selectively deactivated within said second time period; and

a central monitoring unit electrically coupled to said wiring, and including means for selectively deactivating said central monitoring unit, said central monitoring unit receiving said alarm detection signal and providing a secondary alarm signal in human perceivable form a third predetermined time period after receiving said alarm detection signal unless selectively deactivated within said third time period.

4,446,455

STOVE ALARM SYSTEM

Ralph G. Nashawaty, 30 Ridgewood Dr., Norwood, Mass. 02062

Filed Feb. 27, 1981, Ser. No. 238,695

Int. Cl.[3] **H05B** *1/02*

U.S. Cl. 340—568 **11 Claims**

1. An alarm system for use in a stove having a burner and a

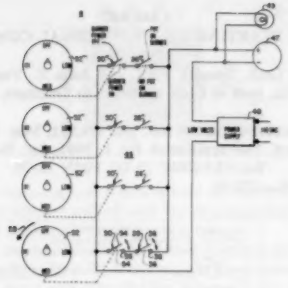
control device for turning on and off the burner, the improvement comprising:

an alarm device;

an alarm circuit for activating said alarm device;

a low voltage power supply for energizing said alarm circuit independently of said burner;

sensor means for sensing the presence or absence of a utensil on said burner;



first switching means in said alarm circuit for closing a first set of contacts in said alarm circuit in response to said control device being in the burner-on condition; and

second switching means disposed in said alarm circuit and having a second set of contacts in series with said first set of contacts said second set of contacts closing in response to the sensing by said sensor means of the absence of a utensil on said burner to complete the alarm circuit and activate the alarm device when said control device is in the burner-on condition and no utensil is on the burner.

4,446,456

DENTAL TREATMENT APPARATUS

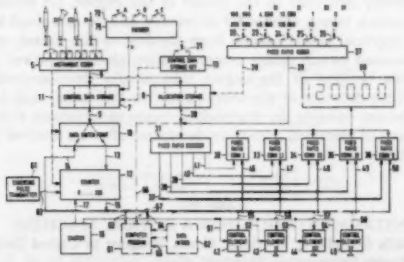
Stefan Beier, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,067

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3045011

Int. Cl.[3] **G09G** *3/00*; **G06K** *15/18*

U.S. Cl. 340—706 **8 Claims**



1. A dental treatment apparatus having a plurality of dental instruments, a control for each instrument, and a display means for displaying the magnitude of the operating parameter of the instrument, said treatment apparatus comprising:

(a) a data storage means having a plurality of registers for storing a plurality of predetermined control data words for each of said instruments,

(b) a preselection switch means for selecting one of said control data words for said instrument as it is initially withdrawn from said holding means, said preselection switch means also being operable to selectively retrieve a control data word for each of said instruments from a plurality of data words previously entered for each instrument,

(c) switch means operable to alter the selected control data word to a value different from said control data word value, and selectively store said value in said data storage means as a control data word,

(d) a control means for driving each of said instruments in response to the control data word selected by said preselection means,

(e) a display means to display the magnitude of the operating parameter derived from the control data word used to drive the dental instrument, said display means adapted to display variable values as said control data word is varied.

4,446,457

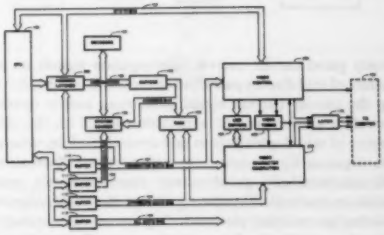
VIDEO TERMINAL CHARACTER GENERATOR

Michael C. Alexander, Austin, Tex., assignor to Data General Corporation, Westboro, Mass.

Filed Jul. 6, 1981, Ser. No. 280,612

Int. Cl.[3] **G09G** *1/16*

U.S. Cl. 340—745 **10 Claims**



1. Apparatus for generating raster line dot information for use in displaying character fields on a raster scan video display monitor, each character field consisting of a plurality of raster line segments, each raster line segment consisting of a portion for displaying a raster line character dot pattern and at least one portion for providing intercharacter spacing, said apparatus comprising:

means for supplying signals identifying the character to be displayed in each of said character fields;

means for supplying signals identifying which of said plurality of raster line segments within said character field is to be displayed;

memory means, containing at least a plurality of raster line character dot patterns, for supplying individual ones of said plurality of raster line character dot patters in response to said character identifying signals and said raster line segment identifying signals;

means for generating a first set of input signals;

means for generating a second set of input signals;

means for generating a selection signal for each of said raster line segments; and

means,.responsive to said selection signal, for selecting between said first set and said second set, the selected set to be used as the dot pattern for said at least one intercharacter spacing portion.

4,446,458

MONITORING AND CONTROL SYSTEM

Donald Cook, 927 Mulford, Evanston, Ill. 60202

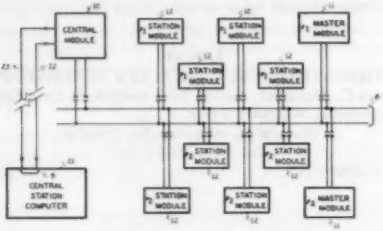
Filed Sep. 14, 1981, Ser. No. 302,094

Int. Cl.[3] **H04Q** *9/00*; **H04M** *11/04*

U.S. Cl. 340—825.06 **16 Claims**

3. A monitoring and control system comprising; a full duplex central module and a plurality of full duplex station modules, means for continuously monitoring from the central module

the status conditions of said station modules utilizing an improved communications system comprising means for generating a synchronously gated sinusoidal carrier current signal located in each of said modules, said carrier current signals having first and second frequencies arranged in a full duplex two frequency transmission pair common to all modules, means for coupling said carrier current signals to an AC power distribution system, said central module including means for continuously and sequentially interrogating all of said station modules by selectively addressing each station module, said station modules having receiving means responsive to synchro-



nously gated carrier current interrogation signals on one frequency of said duplex pair from said central module for rendering the carrier current signal generating means operative to provide a carrier current verification signal on the other frequency of said duplex pair to said central module, wherein said interrogation signals comprise a plurality of discrete, sequential synchronously gated carrier current signals, and have durations controlled by the receipt of the verification signals, said station modules also including means for sensing an off-normal condition and transmitting an off-normal condition indicative signal to said central module upon the occurrence of an off-normal condition.

4,446,459

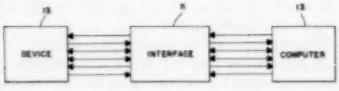
DIGITAL INTERFACE FOR BI-DIRECTIONAL COMMUNICATION BETWEEN A COMPUTER AND A PERIPHERAL DEVICE

Hollis H. Bond, Jr., and Carl R. Franklin, both of League City, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Feb. 18, 1981, Ser. No. 235,472

Int. Cl.[3] **H04Q** *9/00*

U.S. Cl. 340—825.21 **6 Claims**



1. Apparatus for facilitating transfer of an information signal between a first device and a second device, comprising:

first switching means, receiving a selection signal and adapted to receive a first signal from the first device and a second signal from the second device, for producing the first signal or the second signal, in response to said selection signal, as a third signal;

first signal generating means receiving said third signal for generating a switching signal in response to said third signal;

second switching means, receiving said switching signal, and adapted to receive an initialization signal from the first device indicative of the direction of transfer of an information signal, for producing said selection signal indicative of said switching signal and the initialization signal; and

second generating means receiving said selection signal, adapted to receive the second signal, and adapted to provide an output signal to the second device or producing said output signal indicative of said selection signal and the second signal to inform the second device whether or not to receive or cease producing information signals.

4,446,460

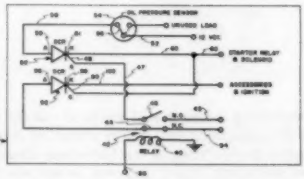
REMOTE STARTING OF AN INTERNAL COMBUSTION ENGINE

Steven G. Tholl, Spanish Fork, and John C. Vonkohlar, IV, Springville, both of Utah, assignors to Transtart, Inc., Provo, Utah

Continuation-in-part of Ser. No. 129,931, Mar. 13, 1980, abandoned. This application Jul. 8, 1981, Ser. No. 281,523

Int. Cl.[3] **G08C** *19/00;* **F02N** *11/06*

U.S. Cl. 340—825.69 **8 Claims**



1. A system for remotely starting an internal combustion engine comprising:

a transmitter from which predetermined coded signals are caused to selectively issue;

a receiver unconnected and separate from the transmitter, the receiver comprising circuit means comprising means insuring reception of correctly encoded signals of desired frequency and means operable only when correct signals have been received;

the receiver further comprising execution circuit means connected to and enabled when the operable means are caused to be operable by the correct signals, the execution circuit comprising (a) means actuated by the operable means, (b) first switch means connected to and closed by the actuated means causing electrical power to be selectively delivered to the starter of the engine, (c) second switch means connected to receive and be energized by electrical power issuing from the first switch means, the second switch means communicating electrical power to the ignition of the engine substantially simultaneously with delivery of electrical power to the starter and (d) means opening the first switch means to terminate delivery of electrical power to the starter after an interval of time.

4,446,461

INSTRUMENTATION FOR A ROTARY MACHINE

Franklin G. Selleck, Portland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,632

Int. Cl.[3] **G08C** *19/06;* **H01F** *15/02, 21/04*

U.S. Cl. 340—870.32 **10 Claims**

1. For a rotary machine of the type having a first member and a second member capable of rotational movement relative to each other, a device for transferring electrical energy between such members which comprises:

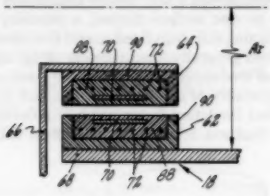
a first member;

a first electrical coil which is fixed to the first member and which is adapted to form with another coil a pair of coils for transferring electrical energy;

a second member which is spaced from the first member and

which is capable of relative rotational movement with respect to the first member, the second member having a first layer of bonding agent, and,

a second layer of a bonding agent which has a magnetizable filler material disposed therein and which extends between the first layer and the second member to attach the first layer to the second member; and



a second electrical coil which is held by the first layer and which is adapted to form with the first electrical coil a pair of coils for transferring electrical energy;

wherein the magnetizable material has a magnetic permeability greater than the magnetic permeability of the bonding agent of the second layer and wherein the second layer affects the coupling of the magnetic flux linkages between said electrical coils and spaces said second coil away from the second member to reduce eddy currents in the second member.

4,446,462

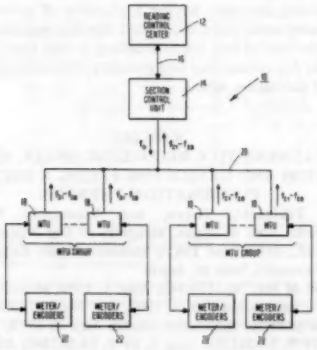
METHOD AND APPARATUS FOR MULTIPLE FREQUENCY TRANSMISSION OF INFORMATION IN A DIGITAL COMMUNICATION SYSTEM

Maurice J. Ouellette, North Berwick, Me., and William C. Hughes, Scotia, N.Y., assignors to General Electric Company, Somersworth, N.H.

Filed Mar. 1, 1982, Ser. No. 353,501

Int. Cl.³ H04Q 9/00; H04M 11/04; H04B 3/54

U.S. Cl. 340—825.07 **21 Claims**



1. In an apparatus for for transmitting information, in the form of a modulated carrier frequency, through a communications medium in response to a received command, a method of minimizing errors in said information attributable to said communications medium, said method comprising the steps of:

a. providing means for transmitting said information using any one of at least two different selectable carrier frequencies;

b. transmitting said information at a first carrier frequency, selectable by a portion of a first received command; then

c. transmitting said information using at least one other carrier frequency; selectable by a portion of at least one additional received command.

4,446,463

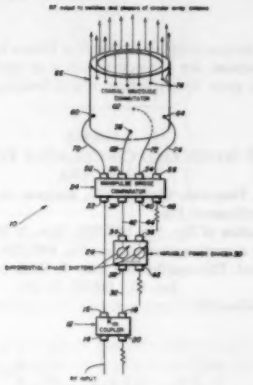
COAXIAL WAVEGUIDE COMMUTATION FEED NETWORK FOR USE WITH A SCANNING CIRCULAR PHASED ARRAY ANTENNA

Edward P. Irzinski, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1982, Ser. No. 351,831

Int. Cl.³ H01Q 3/22, 3/24, 3/26; H01P 5/12

U.S. Cl. 343—371 **9 Claims**



1. A coaxial waveguide commutation feed network for generating a commutatable low-sidelobe amplitude distribution in response to an rf input signal suitable for feeding radiating elements of an associated circular phased array antenna comprising:

a K_{db} coupler for dividing the rf input signal into a TEM path signal and a TE_{11} path signal;

a variable power divider incorporating a pair of differential phase shifters operatively connected to said K_{db} coupler for dividing the TE_{11} path signal into a first variable amplitude TE_{11} path signal and a second variable amplitude TE_{11} path signal, the amplitude of one of the signals being proportional to the sine α and the amplitude of the other signal being proportional to the cosine α, α being derived from the phase settings of said pair of differential phase shifters;

a monopulse bridge comparator having four output ports for four-port balanced feeding, and operatively connected at its input to the TEM path signal of said K_{db} coupler, and the first and second variable amplitude TE_{11} path signals of said variable power divider; and

a coaxial waveguide commutator operatively connected at its inputs to the four output ports of said monopulse bridge comparator such that the TEM path signal excites the TEM mode and the first and second variable amplitude TE_{11} path signals excite a pair of spatially orthogonal TE_{11} modes in said coaxial waveguide commutator and at its outputs.

4,446,464

AIRBORNE TACAN EQUIPMENT UTILIZING A LOGARITHMIC AMPLIFIER

Jesse S. LeGrand, Titusville, Fla.; William Fockler, Wayne, and Mairice L. J. Jezo, Cedar Grove, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,347

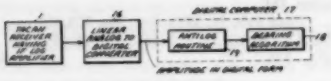
Int. Cl.³ G01S 1/44

U.S. Cl. 343—399 **9 Claims**

1. Airborne Tacan equipment comprising:

first means to receive Tacan signals and to provide an output

signal containing modulation components carrying bearing information, said first means including a first logarithmic amplifier to preserve amplitude modulation of said modulation compenents and to enable operation on input signals having large amplitude variations; and



second means coupled to said first means to at least partially compensate for the non-linearity of said logarithmic amplifier prior to extraction of said bearing information.

4,446,465

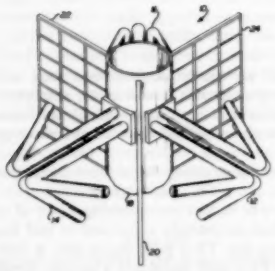
LOW WINDLOAD CIRCULARLY POLARIZED ANTENNA

Joseph A. Donovan, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 957,030, Nov. 2, 1978, abandoned, which is a continuation of Ser. No. 800,539, May 25, 1977, abandoned. This application May 2, 1982, Ser. No. 375,868

Int. Cl.³ H01Q *21/26*

U.S. Cl. 343—797 **9 Claims**



1. A circularly polarized antenna bay comprising a single vertically oriented support mast having a longitudinal axis, three generally planar reflectors, each disposed with respect to said mast such that said longitudinal axis of said support mast essentially lies within said plane of said reflector, whereby said reflectors extend radially from said support mast, said reflectors being equally spaced circumferentially about said mast so as to define three ground planes generally parallel to said mast and equally spaced circumferentially thereabout, said reflectors being wholly supported by said mast, three pairs of crossed dipoles, and means for feeding said pairs so that each radiates circularly polarized electromagnetic waves, said pairs each being located at circumferential positions intermediate said reflectors and each including radiating elements extending generally across the corresponding said ground plane but with said radiating elements each extending towards said ground plane at angles selected so as to substantially equalize the E and H plane patterns thereof.

4,446,466

EXTENDIBLE TUBULAR BOOMS FOR REMOTE SENSORS

Ronald C. Maehl, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,739

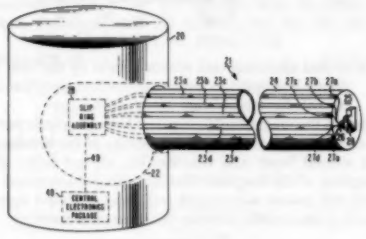
Int. Cl.³ H01Q *1/28*

U.S. Cl. 343—877 **9 Claims**

1. In a spacecraft a system for measuring particles of the local plasma which are sufficiently perturbed by the presence of the main body of said spacecraft to require sensing remote from said main body, said system comprising:

an extendible boom comprising an elongated electrically conductive ribbon attached at one end to said main body of said spacecraft said ribbon being prestressed to assume a rigid tubular shape when extended, and capable of being flattened and coiled about a spool;

said ribbon having a first flexible electrically insulating layer fixed to one surface thereof, a plurality of electrically conducting foil strips fixed to said first insulating layer and disposed generally longitudinally along said ribbon, and a second electrically insulating layer fixed to and covering said plurality of conducting strips, said conducting strips and said insulating layers being of a flexible material and of a thickness relative to said ribbon and its amount of



prestress to thereby permit said ribbon to coil without significant obstruction from said conducting strips and said insulating layers;

means for detecting charged particles in the local plasma, said detecting means attached to the end of said boom remote from said spacecraft body;

means coupled to said remote boom end for connecting said plurality of conducting strips to said detecting means;

utilization means within said main spacecraft body responsive to signals of said detecting means; and

a slip ring assembly having a plurality of spring contacts located within said spool, said slip ring assembly coupled to the end of said boom attached to said main spacecraft body for connecting said plurality of conducting strips to said utilization means.

4,446,467

HEAT-SENSITIVE RECORDING SHEET, AND A METHOD AND DEVICE FOR FIXING A RECORDED INFORMATION THEREON

Ryohei Takiguchi, Tokyo, and Masayoshi Nagashima, Chigasaki, both of Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Division of Ser. No. 174,443, Aug. 1, 1980, abandoned. This application Feb. 9, 1982, Ser. No. 347,340

Claims priority, application Japan, Aug. 3, 1979, 54-107358; Aug. 3, 1979, 54-107359; Aug. 3, 1979, 54-107360; Aug. 3, 1979, 54-107361; Oct. 8, 1979, 54-128816; Oct. 8, 1979, 54-128817

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **11 Claims**

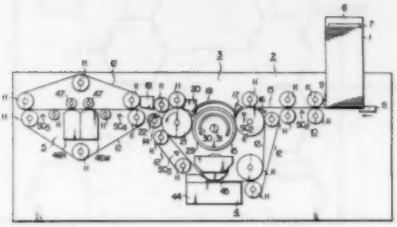
1. A heat-sensitive recording apparatus for performing heat-sensitive recording of information on a heat-sensitive recording sheet having on its surface a heat-sensitive layer containing a diazo compound and a coupling agent, which apparatus comprises:

a thermal head comprising a plurality of heating elements for selectively heating the heat-sensitive layer corresponding to given information to be recorded;

a photofixing system for photofixing the information recorded by the heating through the thermal head, which comprises a light emitting part for uniformly irradiating

light over all the surface of the heat-sensitive recording sheet;

a transporting means for passing the heat-sensitive recording sheet through a heating means including the thermal head



and through a light-irradiating means including the photofixing system; and

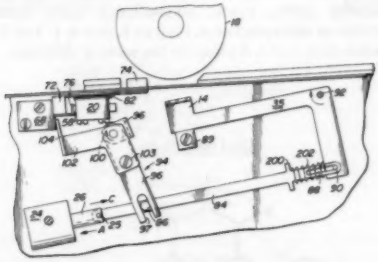
a preactivating system for optically activating said heat-sensitive layer before performing a heat recording.

4,446,468

SINGLE PIECE TRIGGER AND KNOCK OFF MECHANISM

George Franke, Amherst, N.H., assignor to Simplex Time Recorder Co., Gardner, Mass.

Filed Aug. 20, 1982, Ser. No. 410,164
Int. Cl.³ G07C *1/06*
U.S. Cl. 346—82 **11 Claims**



1. Single piece trigger and knock off mechanism for a switch operable card printer and a moveable element operatively associated therewith comprising:

a first arm disposed to be contacted by a moving card,

a second arm disposed to be contacted by a moveable element operatively associated with a switch operable card printer,

a pivot member,

said first and second arms being integrally connected to each other and to said pivot member so that the arms are pivotably displaceable together in a first direction about a first pivot axis upon contact between the first arm and the moving card,

said second arm being constructed and arranged so that it is pivotably displaceable in a second direction about a second pivot axis upon contact with the moveable element of the card printer,

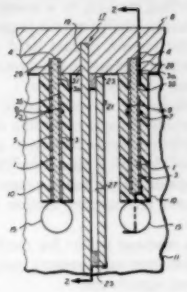
said second arm being disposed to contact a switch which operates the card printer upon displacement in said first direction and to release the switch upon displacement in the second direction.

4,446,469

INK JET PRINTER ARRAY

Theodore P. Perna, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1982, Ser. No. 364,065
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **1 Claim**



1. A pulsed liquid droplet ejecting apparatus array comprising:

(a) at least two jets, each of said jets comprising a rectangular transducer arranged abaxially to a channel for containing a fluid;

(b) a rigid member comprising a rigid member having walls in spaced relationship located between said jets for reducing mechanical crosstalk between said jets; and wherein

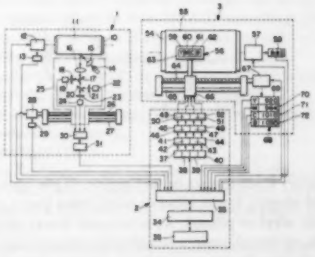
a section of said transducer is held in a reaction member, and said section of said transducer is isolated from transducer activation.

4,446,470

INK-JET COLOR PRINTING SYSTEM

Masatoshi Sugiyama; Kazutaka Yoshida, and Akira Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 1, 1982, Ser. No. 384,086
Claims priority, application Japan, May 30, 1981, 56-82989
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **10 Claims**



1. An ink-jet color printing method for forming a color picture in the form of dot patterns with ink dots of a plurality of colors on a recording medium, comprising the following steps:

(1) utilizing ink-jet color printing apparatus comprising:

color image information input means for receiving color image information of picture elements in the form of digital signals;

memory means for memorizing the said digital signals of the color image information;

image processing means for masking said digital signals of the color image information;

head assembly means closely adjacent said recording medium, including at least a group of ink-jet heads for ejecting yellow ink drops, a group of ink-jet heads for ejecting magenta ink drops and a group of ink-jet heads for ejecting cyan ink drops;

two-dimension scanning means for scanning the surface of said recording medium by a continuous motion of said head assembly relative to said recording medium and an intermittent motion of said head assembly relative to said recording medium in the direction perpendicular to that of said continuous motion;

detecting means for detecting positions of said head assembly relative to said recording medium in the direction of said continuous motion to generate first signals;

a plurality of detecting means for detecting positions of said groups of ink-jet heads, respectively, in the direction of said intermittent motion to generate second signals;

information read-out means for reading the color image information from said memory means corresponding to said second signals; and

means for each group of ink-jet heads to convert color density signals of a single color of ink drops to be ejected by said ink-jet heads extracted from said color image information into analog signals and to feed said analog signals to said ink-jet heads corresponding to said first signals in order to drive them;

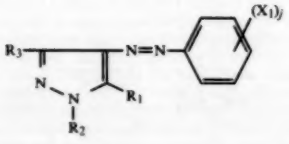
(2) utilizing a masking technique comprising carrying out a non-linear masking procedure;

(3) utilizing aqueous ink comprising yellow dye of the formula [I] hereinbelow supplied into the said yellow ink-jet head;

(4) utilizing aqueous ink comprising magenta dye of the formulae [II-a], [II-b] or [II-c] hereinbelow supplied into the said magenta ink-jet head; and

(5) utilizing aqueous ink comprising cyan dye of the formula [III] hereinbelow supplied into the said cyan ink-jet head;

[I] yellow dye:

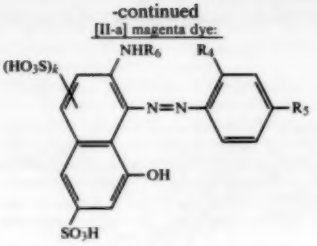


wherein R_1 is amino or acylamino, R_2 is phenyl, substituted phenyl, lower alkyl or substituted lower alkyl, R_3 is lower alkyl or phenyl, X_1 is halogen, lower alkyl, alkoxy, sulfo, carboxyl, amino, substituted amino, cyano, alkylsulfonyl, nitro, hydroxy, ureido or alkoxycarbonyl, j is 0, 1, 2 or 3, provided that when j is 2 or 3, X_1 can be the same or different and the number of sulfo groups is 1–3;

[II-a] magenta dye:

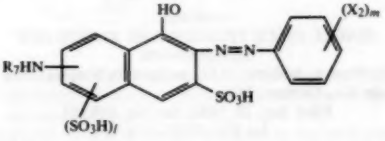
-continued

[II-a] magenta dye:



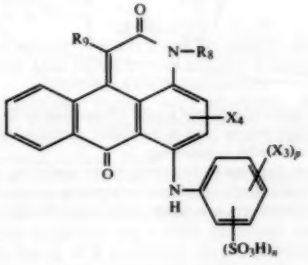
wherein R_4 is cyano, alkylsulfonyl, arylsulfonyl, trifluoromethyl, trichloromethyl, or halogen, R_5 is amino, acylamino, substituted ureido, alkoxy or acyloxy, R_6 is hydrogen, lower alkyl, phenyl or acyl, and k is 0 or 1;

[II-b] magenta dye:



wherein R_7 is hydrogen, acyl, lower alkyl or phenyl, X_2 is halogen, lower alkyl, alkoxy, sulfo, carboxyl, amino, substituted amino, cyano, alkylsulfonyl, nitro, hydroxy, ureido or alkoxycarbonyl, l is 0 or 1, m is 0, 1, 2 or 3, and when m is 2 or 3, X_2 may be the same or different;

[II-c] magenta dye:

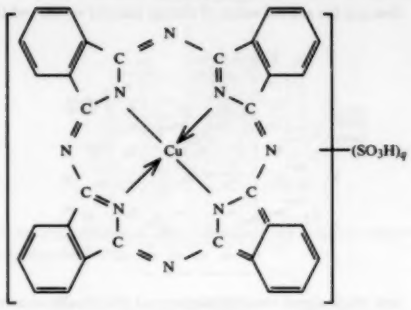


wherein R_8 is hydrogen, lower alkyl or phenyl, R_9 is hydrogen, lower alkyl, phenyl, alkoxycarbonyl, carboxyl or cyano, X_3 is lower alkyl, halogen, alkoxy, carboxyl, cyano, hydroxy or nitro, X_4 is hydrogen or lower alkyl, n is 1, 2 or 3, p is 0, 1, 2, 3 or 4, provided that when p is more than 2, X_3 may be the same or different.

[III] cyan dye:

-continued

[III] cyan dye:



wherein q is 1 to 4, and the metal salts, ammonium salts and organic amine salts of the sulfone groups in formulae [I], [II-a], [II-b], [II-c] and [III].

4,446,471

ELECTROSTATIC RECORDING METHOD AND APPARATUS THEREFOR

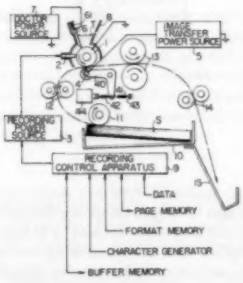
Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,832

Claims priority, application Japan, Dec. 20, 1978, 53-160643; May 29, 1979, 54-66621

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **42 Claims**



1. A recording method comprising the steps of:

bringing a multistylus electrode, to which a pattern signal is applied, into contact with toner having a charge retention property,

forming a charge distribution in said toner on a donor, corresponding to said pattern signal to be applied to said multi-stylus electrode, utilizing the charge injection into said toner by said multi-stylus electrode, and

forming said charge distribution into a visible pattern, wherein said charge distribution of said toner on said donor is formed by toner charged by said multi-stylus electrode, utilizing the charge injection of said multi-stylus electrode, and by uncharged toner, and said visible pattern is obtained on a recording sheet by selectively transferring said charged toner electrostatically to said recording sheet and fixing the same to said recording sheet.

4,446,472

ELECTROPHOTOGRAPHICALLY INFORMATION RECORDING METHOD

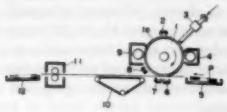
Hideaki Kato, and Hideyuki Handa, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

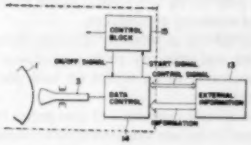
Continuation of Ser. No. 154,572, May 29, 1980, abandoned. This application Oct. 7, 1982, Ser. No. 433,351

Claims priority, application Japan, Jun. 2, 1979, 54-68209; Jun. 2, 1979, 54-68210

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—153.1 **6 Claims**





4. Apparatus for recording information comprising:

(I) an external information source (**13**) for supplying information in the form of successive blocks of electric information signals, each block containing a start signal (**S1**) and an end signal (**S2**) and requiring an information transfer time period (t_1) for transfer;

(II) an electrophotographic recorder comprising:

(A) a member (**1**) operable to move at constant speed,

(B) a photosensitive element (**1***a*) on the surface of said member,

(C) a charging electrode (**2**) adjacent said member and operable to electrostatically charge said photosensitive element,

(D) a scanning reproducer (**3**) operable to project an optical image onto said photosensitive element to provide a latent image,

(E) a developer (**4**) for developing said latent image,

(F) a transfer means (**6**) operable to transfer an image on said photosensitive element to a sheet of recording paper (**P**),

(G) a separating means (**7**) operable to separate a page of recording paper from said member,

(H) a discharge means (**8**) operable to remove a remaining charge from said photosensitive element,

(I) a cleaner (**9**) operable to remove residual toner from said photosensitive element,

(J) a toner fixer (**11**),

(K) paper feeding means operable to feed a sheet of paper from a paper feeding tray (**5**) to said member, to said toner fixer and to a receiving tray (**12**) within a paper feed time period (t_3),

(L) said recorder requiring an element travel time period (t_2) for said photosensitive element to reach said scanning reproducer, said recorder having a minimum treatment time period (T_1) for one cycle of operation commencing with introduction of one sheet of paper until introduction of the next successive sheet of paper;

(III) and an information transfer and control system for transferring information signals from said external information source to electrophotographic recorder for reproduction on said recording paper and comprising a data control block (**14**) and an electrophotographic treatment control block (**15**);

(A) said data control block (14) comprising:
(a) a means (16) operative to read a start signal (S1) and an end signal (S2) in each of said signal information blocks,
(b) a means (17) operative to count the minimum treatment time period (T_1) using a start signal (S1) as a reference,
(c) a means (18) operative to compare the information transfer time period (t_1) between the start signal (S1) and the end signal (S2) with the minimum treatment time period (T_1) for one cycle of operation and adapted to provide a recorder start signal to said treatment control block (15) when an end signal (S2) is detected,
(d) and a memory for receiving, storing and releasing blocks of electric information signals;
(B) said treatment control block (15) operable in response to said recorder start signal from said control data block (14);
(a) to initiate operation of said member,
(b) to initiate simultaneous operation of said charging electrode,
(c) and after lapse of an element travel timer period (t_2) during which said photosensitive element reaches said scanning reproducer,
(i) to provide an ON (write) signal to start operation of said scanning reproducer,
(ii) to release a block of electric information signals from said memory to said scanning reproducer for conversion to an image on said photosensitive element,
(iii) to initiate operation of said paper feeding means,
(iv) and to initiate synchronized sequential operation of said developer, transfer means, separating means, discharge means, cleaner and fixer;
(IV) said apparatus being operable in several modes including:
(A) a first mode wherein information transfer speed is high and wherein, when said time period (t_1) for transfer of a block of information is equal to or less than said minimum time period (T_1) for one cycle of operation, operation of said scanning reproducer and said paper feeding means by provision of said start signal are commenced subsequent to receipt of an end signal by said data control block;
(B) a second mode wherein information transfer speed is low and wherein, when said time period (t_1) for transfer of a block of information is greater than said minimum time period (T_1) for one cycle of operation, operation of all components of said recorder, except operation of said scanning reproducer and said paper feeding means, are continued so that formation of a latent image on said photosensitive element and operation of said paper feeding means can be started immediately upon receipt of a start signal by said electrophotographic treatment block from said data control block.

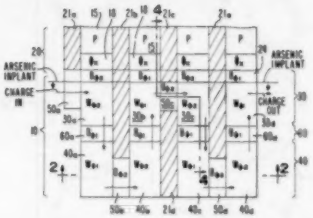
4,446,473

SERPENTINE CHARGE TRANSFER DEVICE

Joan Pendleton, Mountain View, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Apr. 30, 1981, Ser. No. 258,866
Int. Cl.³ H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 **24 Claims**

1. A charge transfer device comprising:
a first series of charge transfer wells arranged sequentially, each alternate well separated from the subsequent well by first electrically controllable barrier means for controllably restricting charge flow thereunder and separated from the preceding well by channel stop means for preventing charge flow thereunder;
a second series of charge transfer wells arranged sequentially and disposed adjacent the first series but separated therefrom by second electrically controllable barrier means for controllably restricting charge flow thereunder, each alternate well in the second series being separated from the subsequent well by the channel stop means and separated from the preceding well by the first electrically controllable barrier means; and
wherein a first clock signal controls alternate wells of the first and the second series of charge transfer wells, and the



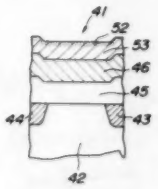
first clock signal controls the second electrically controllable barrier means and a second clock signal controls the remaining wells of each of the first and the second series of charge transfer wells, and the second clock signal controls the first electrically controllable barrier means.

4,446,474

ION SENSOR FET WITH SURFACE TREATED METAL GATE

Takashi Mizusaki, Tokyo; Tadayuki Matsuo, Sendai; Masayoshi Esashi, Sendai, and Hiroshi Abe, Sendai, all of Japan, assignors to Olympus Optical Co. Ltd., Japan

Filed Jun. 27, 1980, Ser. No. 163,792
Claims priority, application Japan, Mar. 19, 1980, 55-33898; Mar. 19, 1980, 55-33899
Int. Cl.³ H01L *29/78*; G01N *27/30*
U.S. Cl. 357—25 **3 Claims**



1. A field effect transistor type ion sensor comprising an inorganic film formed on a gate insulating film of a field effect transistor, and an impurity layer formed in at least the surface layer of said inorganic film, and containing an impurity sensitive to a given ion, said impurity layer being operative as an ion sensitive region when it makes contact with a test substance, and said inorganic film is formed of a composition selected from the group consisting of silver (Ag), copper (Cu), cadmium (Cd) and lead (Pb).

4,446,475

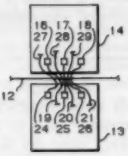
MEANS AND METHOD FOR DISABLING ACCESS TO A MEMORY

Anil Gercekci, Geneva, Switzerland, and Heinz B. Maeder, Taeby, Sweden, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,197
Int. Cl.³ H01L *27/04*; G11C *11/40*
U.S. Cl. 357—40 **6 Claims**

5. A method of disabling direct access to at least a portion of a memory comprising: providing at least one contact pad on a semiconductor chip wherein the memory is located; providing coupling means to the at least one contact pad to couple the

contact pad to the at least a portion of the memory; providing lines as a portion of the coupling means, the lines extending off



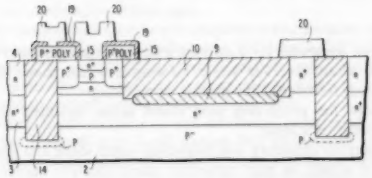
of the semiconductor chip; disabling the coupling means by severing the lines.

4,446,476

INTEGRATED CIRCUIT HAVING A SUBLAYER ELECTRICAL CONTACT AND FABRICATION THEREOF

Randall D. Isaac; Tak H. Ning, and Denny D. Tang, all of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,119
Int. Cl.³ H01L *23/48, 29/46, 29/62, 27/12*
U.S. Cl. 357—67 **8 Claims**



1. An integrated circuit containing a semiconductive substrate having field isolation regions and electrical conductive regions of active impurity dopants wherein the improvement comprises a refractory metallic silicide entirely located beneath field isolation regions and having its entire lower surface in direct electrical contact with electrical conductive regions of active impurity dopants.

4,446,477

MULTICHIP THIN FILM MODULE

Thomas P. Currie, St. Paul, Minn., and Norman Goldberg, Dresher, Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 21, 1981, Ser. No. 294,100
Int. Cl.³ H01L *23/48, 23/02, 39/02*
U.S. Cl. 357—74 **8 Claims**

1. A multichip thin film module for hybrid packaging of semiconductor devices, comprising:

a single layer ceramic base substrate,

an array of via holes extending through said base substrate,

sealed conductive vias in said array of via holes in said base substrate,

lead out pins connected to said vias in said base substrate,

a top cover sealed to said base substrate forming a closed package therewith,

a ceramic processing substrate adapted to be completed before being placed in said closed package,

said processing substrate having a uniform flat top surface,

an array of via holes extending through said processing substrate having the same array pattern as the via holes in said base substrate,

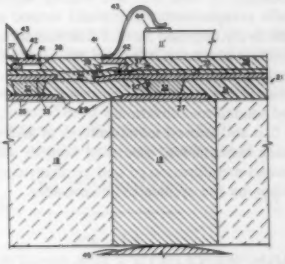
conductive vias in said array of via holes in said processing substrate forming an extension of said sealed conductive vias,

a conductive ground plane pattern formed on the top surface of said processing substrate leaving annular insulating rings around the top of said conductive vias,

a first insulating layer formed over said ground plane and said conductive vias in said processing substrate,

apertures in said first insulating layer forming a predetermined pattern of openings exposing contact areas of said ground plane and said conductive vias in said processing substrate,

a first plurality of thin film conductive pattern lines on said first insulating layer, said conductive pattern lines being photolithographically formed as a pattern of X-direction line closely spaced one to another, some of said X-direction lines being connected to said conductive vias in said processing substrate and some others of said lines being connected to said ground plane and yet others of said lines being adapted to form wiring interconnection lines between semiconductor devices,



a second insulating layer formed over said X-direction lines,

apertures in said second insulating layer forming access to some of said X-direction lines,

a second plurality of thin film conductive pattern lines on said second insulating layer, said conductive pattern lines being photographically formed as a pattern of Y-direction lines closely spaced one to another, some of said Y-direction lines being connected to said X-direction lines and some of Y-direction lines being adapted to form wiring interconnection lines between semiconductor devices,

pads connected to some of said X-direction lines and some of said Y-direction lines adapted to be connected to said semiconductor devices,

semiconductor devices connected to said pads to form a circuit therewith, and

means for connecting said vias in said processing substrate with said vias in said base substrate to connect said circuit to said lead out pins to form a module therewith.

4,446,478

ASSEMBLY IN A SINGLE CASE OF A MAIN POWER-SWITCHING SEMICONDUCTOR COMPONENT AND A DESTORAGE DIODE

Pierre Bacuvier, Paris, France, assignor to Le Silicium Semiconducteur SSC, Paris, France

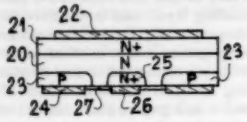
Filed Dec. 1, 1980, Ser. No. 211,945
Claims priority, application France, Dec. 7, 1979, 79 30125
Int. Cl.³ H01L *23/16*
U.S. Cl. 357—75 **11 Claims**

1. An assembly in a single case comprising:

a main power-switching semiconductor component of the Darlington or amplifying gate thyristor type and having at least first and second metallizations on one face thereof with said first metallization being centrally located and said second metallization extending around said first metallization; and

a three terminal auxiliary component defining at least a first

resistance and a destorage diode in series with a second resistance and having in monolithic form a substrate of a first type of conductivity, a uniform layer of said first type of conductivity and with a heavy doping level on the rear face of said substrate, a metallization coating said uniform layer on said rear face, a first layer of the second type of conductivity with a high doping level on the front face of said substrate at the periphery thereof, a second layer of the first type of conductivity with a high doping level on the front face of said substrate centrally thereof, said first layer extending around said second layer, the surfaces



occupied by said first and second layers being substantially complementary, first and second metallizations respectively disposed on said first and second layers so that said first resistance is formed between said rear face metallization and said second metallization and said diode in series with said first resistance is formed between said first and second metallizations;

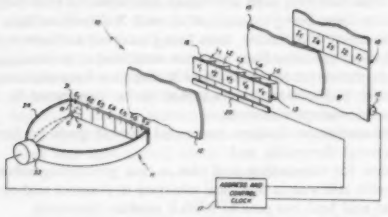
said first and second metallizations of said main component being brought into electrical contact with said first and second metallization of said auxiliary component, respectively, by the application of pressure.

4,446,479

LUMINESCENT DEVICE FOR HIGH RESOLUTION OPTICAL ADDRESS AND LIGHT VALVE IMAGING APPARATUS EMPLOYING SUCH DEVICE

Clark N. Kurtz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,044
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **9 Claims**



1. In a device for optically addressing a linear, optical-address region, and having (1) a linear array of discrete lens elements, each element adapted to focus incident collimated light from a plurality of different incidence directions respectively onto different pixel spots of its particular multi-spot address zone of the optical-address region; and (2) control means for directing collimated light onto all elements of said linear lens array sequentially from different ones of such plurality of different incidence directions, the improvement wherein said control means comprises:

(a) a strip of luminescent material having discrete light emission regions respectively for each of said different incidence directions;

(b) means for sequentially stimulating said discrete emission regions to emit light; and

(c) lens means, located between said luminescent material strip and said linear array, for collimating light from each of said light emission regions respectively along different directions onto said linear lens,

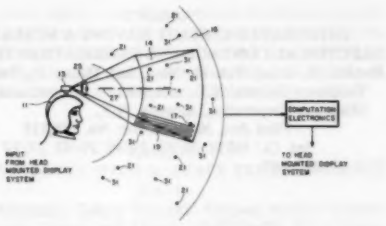
whereby a different pixel spot set, each set including one pixel spot in each of the address zones, is optically addressed in response to each sequential stimulation of said emission regions.

4,446,480

HEAD POSITION AND ORIENTATION SENSOR

Denis R. Breglia, Altamonte Springs, and Frank J. Oharek, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 14, 1981, Ser. No. 330,756
Int. Cl.³ H04M *7/18*
U.S. Cl. 358—104 **10 Claims**



1. An apparatus for monitoring the head position and orientation of an observer while viewing a visual scene upon a spherical retroreflective screen, comprising:

means for projecting said visual scene mounted on said observer's head;

means for detecting said projected visual scene at a plurality of points on said spherical retroreflective screen, said detecting means having an electrical signal output corresponding to each of said points;

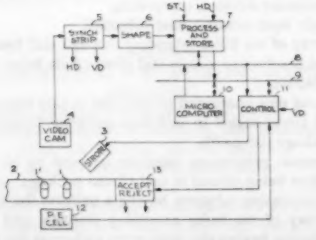
computational means for correlating said detecting means output to said visual scene temporally, and for solving for head position and orientation, receiving input from said detecting means and said projecting means, and outputting a signal based thereon.

4,446,481

AUTOMATIC PRODUCT INSPECTION SYSTEM

Kunihiko Edamatsu, and Takayoshi Makabe, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 4, 1980, Ser. No. 137,548
Claims priority, application Japan, Apr. 5, 1979, 54-41332
The portion of the term of this patent subsequent to Jan. 1, 2000, has been disclaimed.
Int. Cl.³ H04M *7/18*
U.S. Cl. 358—106 **6 Claims**



1. Apparatus for automatically checking a product which

has at least one element which, when viewed two-dimensionally, is normally a straight line, including;

a raster-scanned photo-electric converter for viewing said product;

synchronization-signal stripping means coupled to said converter and responsive to a composite signal therefrom to produce, separately, horizontal and vertical drive signals, and a video signal free of such drive signals;

signal-shaping means coupled to said stripping means and responsive to said video signal therefrom to produce a series of binary signals representative of said video signal;

signal processing means coupled to said signal-shaping means and responsive to shaped signals therefrom to detect binary transitions therein corresponding to lines viewed by said photo-electric converter;

first counting means coupled to said signal processing means and to said stripping means and responsive to signals from said processing means and to horizontal drive signals from said stripping means to evaluate the "Y" lengths and "Y" coordinates of said lines viewed by said photo-electric converter;

an "X"-pulse generator;

"X"-counting means coupled to said stripping means and to said "X" pulse generator for determining the "X" coordinates of said at least one element viewed by said photo-electric converter;

memory means having stored therein predetermined reference length information and being coupled to said first counting means and to said "X" counting means for storing the "Y" length, "Y"-coordinate and "X"-coordinate information therefrom, and,

automatic calculating means coupled to said memory means for calculating from said stored "Y"-length, "Y" coordinate, "X"-coordinate and predetermined reference length information whether the longest viewed line is at least of said predetermined reference length; and,

control means coupled to said automatic calculating means and responsive to a calculation that the longest viewed line is of at least said predetermined reference length to accept said product and responsive to a calculation that said longest viewed line is not of said predetermined reference length to reject said product.

4,446,482

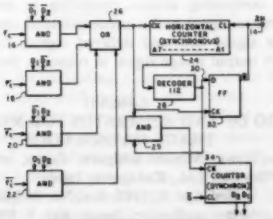
SYSTEM FOR GENERATING 2H PULSES IN A TELEVISION RECEIVER

Gopal K. Srivastava, Buffalo Grove, and Stephen H. Lai, Streamwood, both of, assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 5, 1982, Ser. No. 365,421

Int. Cl.³ H04N *9/40, 5/06*

U.S. Cl. 358—150 **12 Claims**



1. In a television receiver which develops a color subcarrier signal, a system for generating 2H pulses, comprising:

means providing a plurality of reference signals whose frequencies are related to the frequency for the color subcarrier;

means for counting cycles of the reference signals;

control means coupled to said counting means for generating an output pulse after each time the counting means reaches a preselected integral count, each of the output pulses being coupled for clearing the counting means so that the next successive count thereof occurs after a mixed number of reference signal cycles for generating successive ones of the output pulses at a rate equal to twice nominal horizontal scan rate; and

means for sequentially coupling the reference signals to the counting means such that the counting means receives a different reference signal in response to each of the output pulses,

whereby the output pulses constitute said 2H pulses.

4,446,483

CIRCUIT ARRANGEMENT FOR DERIVING A FIELD SYNCHRONIZING SIGNAL FROM AN INCOMING SIGNAL

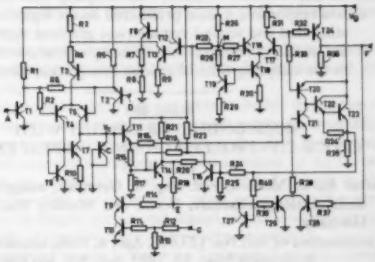
Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,692

Claims priority, application Netherlands, Mar. 12, 1981, 8101202

Int. Cl.³ H04N *5/10*

U.S. Cl. 358—154 **12 Claims**



10. A circuit arrangement for deriving a field synchronizing signal from an incoming signal which contains at least line synchronizing and field synchronizing pulses, and line flyback pulses coincident with said line synchronizing pulses, comprising

first threshold detection means responsive to said incoming signal for determining when a magnitude of said input signal exceeds a predetermined first threshold,

second threshold detection means responsive to an output signal of said first threshold detection means for determining when the magnitude of said output signal exceeds a predetermined second threshold that differs from said first threshold and to generate said field synchronizing signal in response thereto,

gating means responsive to said line blanking pulses and operatively connected to said first threshold detection means for preventing the output of said first threshold detection means from being applied to said second threshold detection means during the occurence of said line synchronizing pulses, and

timing circuit means operatively connected to the output of said second threshold detection means for disabling said gating means for a predetermined time in response to the output of said second threshold detection means.

4,446,484
IMAGE GRADIENT DETECTORS OPERATING IN A PARTITIONED LOW-PASS CHANNEL

Philip G. Powell, Pinner, England, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB81/00074 § 371, Date Nov. 30, 1981, § 102, Date Nov. 30, 1981, PCT Pub. No. WO81/03097, PCT Pub. Date Oct. 29, 1981

This PCT application filed Nov. 30, 1981, Ser. No. 328,543

Int. Cl.³ H04N *5/14, 5/21*

U.S. Cl. 358—166 **9 Claims**

-1	2	-1
-1	2	-1
-1	2	-1

1. In electronic image processing apparatus of the kind in which an image signal representative of the brightness of a plurality of picture elements is applied to a low-pass filter operating in a low-pass channel and the output thereof is a filtered image signal representative of a low-frequency portion of an enhanced image, such apparatus having the additional feature that the low-pass channel is partitioned into a low-pass channel portion and a band-pass channel portion, the latter channel portion comprising a band-pass filter acting as a band-pass image feature detector, such band-pass filter further including (a) a subsidiary low-pass filter arranged to prefilter the image signal and (b) a sampling filter arranged to sample the prefiltered image signal and generate a band-pass feature signal, the improvement wherein said sampling filter comprises:

means responsive to said prefiltered image signal for generating first and second symmetrical gradient signals which are mutually inverted and offset by a time corresponding to the sampling time of at least one picture element.

4,446,485
SEMICONDUCTOR CIRCUIT WITH CLOCK-CONTROLLED CHARGE DISPLACEMENT DEVICES

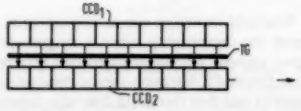
Artur Bardl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 137,604, Apr. 4, 1980, abandoned. This application Mar. 23, 1982, Ser. No. 361,030

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914517

Int. Cl.³ G06G *7/19;* **H01L** *31/00*

U.S. Cl. 358—213 **1 Claim**



1. Semiconductor circuit comprising at least two clock-controlled charge-displacement devices respectively having a multiplicity of storage cells with respective information content, each of the storage cells of a first one of said charge-displacement devices being operatively associated with a respective storage cell of a second one of said charge-displacement devices, respective comparator circuits disposed between the respective associated storage cells of said first and second charge-displacement devices, each of said comparator circuits comprising two field-effect transistors and a diode mutually connected so as to afford a comparison of the information content in the respective associated storage cells, means for transferring the information content of the storage cells of one of said first and second charge-displacement devices to the respective storage cells of the other of said first and second charge-displacement devices operatively associated therewith so as to combine the transfered information content of the storage cells of said one charge-displacement device with the information content of the respective storage cells of said other charge-displacement device, and means operatively associated with one of said at least two clock-controlled charge-displacement devices for serially reading-out therethrough information obtained as a result of the information transfer.

4,446,486
IMAGE SIGNAL PROCESSING CIRCUIT

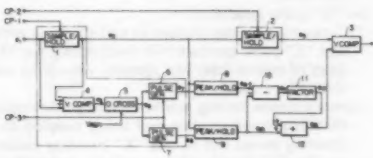
Satoru Itoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,129

Claims priority, application Japan, Mar. 13, 1981, 56-35401

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **4 Claims**



1. An image signal processing circuit comprising:

first delaying means for delaying an input image signal for a first predetermined time period;

first comparing means for comparing said input image signal and a delayed signal provided at an output of said first delaying means for producing a binary signal having a first state when said input image signal has a level above a level of said delayed signal and a second state when said input image signal has a level below a level of said delayed signal;

first and second pulse generating means, operating in response to said binary signal, for producing pulses when said binary signal changes from first state to said second state and from said second state to said first state, respectively;

first and second means for holding a predetermined one of said input image signal and said delayed signal in response to said first and second pulse signals respectively;

means for providing a difference signal representing a difference between outputs of said first and second holding means, respectively;

means for scaling said difference signal by a predetermined scale factor; and

second comparing means, operating in response to said difference signal and a predetermined one of said input image signal and said delayed signal, for producing a binary output image signal in response thereto.

4,446,487
METHOD OF AND APPARATUS FOR READING OUT IMAGE INFORMATION

Kazuo Horikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1982, Ser. No. 365,304

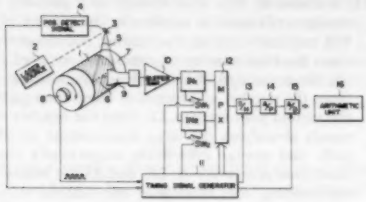
Claims priority, application Japan, Apr. 8, 1981, 56-52685

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **9 Claims**

1. A method of reading out image information stored on a recording medium by detecting and photoelectrically converting emitted, transmitted or reflected light obtained from optical two-dimensional scanning of the image information on the recording medium, integrating the photoelectrically converted output signal according to a predetermined clock, and sampling the integration output, thereby reading out each picture element of the image information,

which method comprises using a plurality of integrators, sequentially switching said integrators to start integration each time a first clock pulse determining the size of said picture element is input, setting the integration periods of said integrators to a value not shorter than one clock length of said first clock pulse so as to partially overlap each other, actuating the sampling of a signal from the



started integrator by a second clock pulse at a point of time within the overlap region of the integration periods but outside the regions where the next integrator is in the switching transient state to integration start mode and where said started integrator is reset, and determining the reset state holding period of each integrator so that each integrator is sufficiently reset to prepare for the start of the next integration.

4,446,488

VIDEO FORMAT SIGNAL RECORDING/REPRODUCING SYSTEM

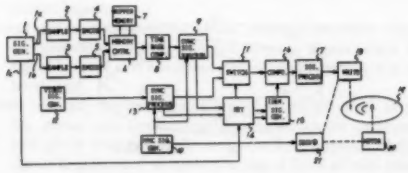
Tsutomu Suzuki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,096

Claims priority, application Japan, Sep. 8, 1980, 55-124284

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **6 Claims**



1. A method for recording a composite voice and image signal on a recording medium of a type wherein a voice field representing audio information and an image field representing video information are combined to form a sequence including image fields and voice fields and are subsequently recorded, with each field being separated from an adjacent field by a vertical blanking interval, each vertical blanking interval including a plurality of horizontal scanning intervals, and each field including a vertical blanking interval followed by an audio or image information signal, the improvement comprising the step of inserting a voice identification signal into a horizontal scanning interval of each said vertical blanking interval which immediately precedes an audio information signal, said voice identification signal further containing information specifying the type of sound represented by said audio information signal as being one of monural, stereo and bilingual.

4,446,489

SIGNAL COPY DEVICE FOR DIGITAL RECORD/REPRODUCTION SYSTEM

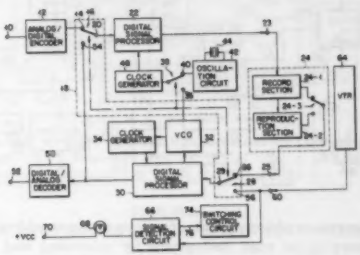
Tadashi Kojima, Yokosuka, and Shigeru Todokoro, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 21, 1981, Ser. No. 333,051

Claims priority, application Japan, Jan. 14, 1981, 56-4335

Int. Cl.³ G11B *27/02, 15/12*

U.S. Cl. 360—13 **9 Claims**



1. A signal record and copy device for a digital record/reproduction system having a record section and a reproduction section comprising:

encoding means for receiving analog signals to be recorded and converting them to first digital encoded signals corresponding thereto;

decoding means for receiving digital encoded signals and decoding them to produce analog signals corresponding thereto;

at least one signal reproducing section from which recorded second digital encoded signals can be reproduced for copying;

switching means selectively actuable to enable the device to operate in a record mode or a copy mode, the switching means being connected to receive the first and second digital encoded signals and, when actuated to the record mode, to supply the first digital encoded signals to the record section for recording, when actuated to the copy mode, to supply the second digital encoded signals to the record section for copying by recording them;

said switching means including a first switch section operable in the copy mode to connect the at least one signal reproducing section to the record section to record the second digital encoded signals and to connect the record section to the decoding means to provide analog monitoring signals corresponding to the recorded second digital encoded signals being recorded, and a second switch section connected to said first switched section and said encoding means and operative in cooperation with said first switched section in the record mode to supply the first digital encoded signals through said first switch section to the record section and to connect the record section to the decode means to provide analog monitoring signals corresponding to the second digital encoded signals being recorded.

4,446,490

PCM SIGNAL PROCESSING CIRCUIT

Susumu Hoshimi, Yokohama, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Sony Corporation and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Nov. 17, 1981, Ser. No. 322,279

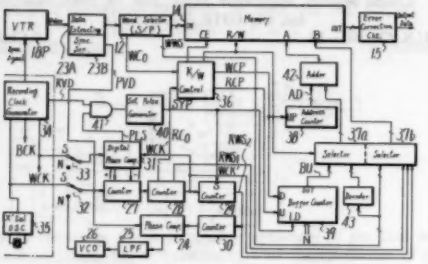
Claims priority, application Japan, Nov. 18, 1980, 55-162177

Int. Cl.³ G11B *5/00, 27/02*

U.S. Cl. 360—32 **14 Claims**

1. A PCM signal processing circuit comprising, a signal input terminal for receiving a PCM data signal from PCM data

signal reproducing apparatus, a memory for storing said PCM data signal and to be designated an address thereof to be written by an address signal being produced with regard to said PCM data signal, a standardized signal input terminal for receiving a standardized signal corresponding to a synchronizing signal for synchronizing said PCM data signal reproducing



apparatus, an address counter for designating an address of said memory to be read, and means for providing said address counter with preset data in response to said every standardized signal as a load signal so that said address counter begins counting read pulses synchronized with said standarized signal from said preset data.

4,446,491

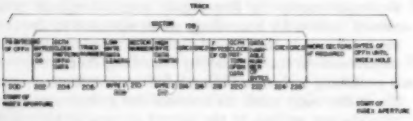
ULTRAHIGH RESOLUTION PHOTOCOMPOSITION SYSTEM EMPLOYING ELECTRONIC CHARACTER GENERATION FROM MAGNETICALLY STORED DATA

James A. Tidd, Northbrook, and Miles H. Tidd, Deerfield, both of Ill., assignors to Alphatype Corporation, Niles, Ill.

Division of Ser. No. 942,893, Sep. 15, 1978. This application Oct. 1, 1980, Ser. No. 192,846

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—48 **13 Claims**



1. A coded font for storing plural alphabet character designs described by groups of successive multi-bit translational commands with each group describing the entire boundary contour of a single alphabet character beginning at a starting coordinate position and successively describing translational movements around the character boundary contour, each successive command identifying either (1) a path selected from a first translational path set consisting of translational paths frequently required in order to describe a character boundary, and uniquely identified by a binary number of X bits or (2) a path selected from a second translational path set consisting of translational paths less frequently required to define a character boundary and uniquely identified by a binary number of 2 X bits, or (3) a large displacement translational path longer than any of the displacement paths of the first and second path sets uniquely identified by a binary number of 3 X bits, comprising

(a) a disc adapted to be mounted for rotation;

(b) a plurality of sequentially ordered, circumferentially spaced, magnetic storage cells formed of material magnetically alterable to store binary signals, said storage cells being arranged into plural circular storage tracks concentrically positioned around the center of said disc to permit the stored signals to be sensed sequentially as the disc is rotated; and

(c) a plurality of character sectors equal in number to the number of character designs stored on the coded font, one said character sector being uniquely associated with each character design, said character sectors being arranged end to end in a predetermined ordered sequence, each said character sector including

(1) a character data field formed of a plurality of said storage cells equal in number to the number of binary bits required to store the starting coordinates plus X times the total number of commands required to identify the associated character boundary contour plus X times the number of commands identifying paths from the second path set plus 2X times the number of commands identifying the large displacement translational path, said storage cells being magnetically altered to store in sequence the X, 2X, and 3X bit binary signals representing the successive translational commands describing the associated alphabet character, and

(2) a non-character data field formed of a number of storage cells preceding said character data field, each said non-character data field having the same number of said storage cells as all other non-character data fields, said storage cells of said non-character data field being magnetically altered to store binary signals identifying the position of the associated said character data field, whereby all of the signals descriptive of a particular character design stored within a track of the disc may be retrieved by rotating the font disc to cause all of the storage cells in which the corresponding character data field is stored to move past a magnetic pick-up succession without interruption.

4,446,492

INFORMATION RECORDING SYSTEM

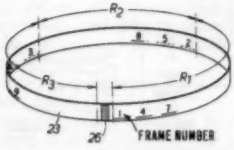
Tomohisa Yoshimaru, Yokohamashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 203,976, Nov. 4, 1980. This application Feb. 7, 1983, Ser. No. 464,372

Claims priority, application Japan, Nov. 6, 1979, 54-143720

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—48 **3 Claims**



1. In an information recording system for storing pages of document information as digital signals comprising:

an endless recording medium for recording digital signals thereon, said recording medium being divided, in the direction of its length, into at least a first and a second successive region;

information supply means for supplying successive units of information to be recorded on said medium including a first, second, third, etc. units of information, said information supply means requiring a first length of time to supply each unit of information, said information supply means including photoelectric scanning means for converting the document information into the digital signals, the digital signals representing one document page comprising one unit of information;

buffer means for accumulating the digital signals supplied by said information supply means until a unit of information has been accumulated; and

control unit means for transferring the accumulated unit of information from said buffer means to said recording medium, said control unit means requiring a second length of time to transfer each unit of information, the second length of time being extremely short compared to the first length of time;

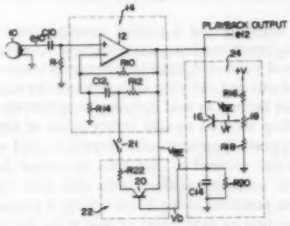
the improvement comprising means within said control unit means for transferring into said first region the first, the n+1, the 2n+1, the 3n+1 . . . units of information supplied from said supply means, and further transferring into said second region the second, the n+2, the 2n+2, the 3n+2 . . . units of information supplied from said supply means, where n equals the total regions contained on the medium.

4,446,493

VARIABLE FREQUENCY-RESPONSE EQUALIZER

Nobuo Terui, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,482
Claims priority, application Japan, Nov. 26, 1980, 55-169361
Int. Cl.³ G11B *5/45*
U.S. Cl. 360—65 **6 Claims**



1. A variable frequency response playback equalizer, comprising:

playback amplifier means responsive to an unequalized input signal and having a given time constant regarding a frequency response characteristic thereof, for equalizing said unequalized input signal to produce an equalized playback output signal;

level sensor means coupled to said playback amplifier means for generating a time constant change signal when the signal level of said equalized output signal exceeds a given level; and

time constant change means coupled to said playback amplifier means and to said level sensor means for increasing said given time constant when said time constant change signal is generated to cause the signal level of said equalized playback output signal to be increased at high frequency regions.

4,446,494

UNIFORM SPEED CONTROL FOR A MULTI-CHANNEL DIGITAL RECORDER

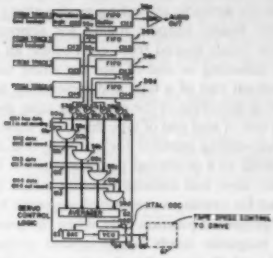
Thomas G. Stockham, Jr., and Bruce C. Rothaar, both of Salt Lake City, Utah, assignors to Soundstream, Inc., Salt Lake City, Utah

Division of Ser. No. 55,689, Jul. 6, 1979, Pat. No. 4,328,580. This application Sep. 8, 1981, Ser. No. 299,838
Int. Cl.³ G11B *15/46*
U.S. Cl. 360—73 **5 Claims**

1. In a multi-channel digital recorder that includes memory for each track of each channel a method for synchronizing playback of information recorded on different tracks on a tape media including the steps of,

measuring memory fullness of each track;

averaging memory fullness of tracks not recorded to provide an average fullness measurement; and



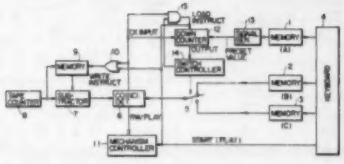
utilize that average fullness measurement to control tape speed.

4,446,495

TAPE PLAYER REPEAT REPRODUCTION WITH OVERLAP

Akira Orimoto, and Kazuo Kamei, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,777
Claims priority, application Japan, Mar. 18, 1981, 56-39133
Int. Cl.³ G11B *15/20*
U.S. Cl. 360—74.1 **11 Claims**



1. A repeat reproduction control system for a tape recorder, comprising;

tape counter means;

reproduction length memory means for storing a signal corresponding to the length of a recorded part of a magnetic tape, which part should be repeatedly reproduced;

repeat frequency memory means for storing a signal corresponding to a number of reproduction repetitions;

overlap length memory means for storing a signal corresponding to a length of a recorded part of said magnetic tape, which part is reproduced with a first repeatedly reproduced recorded part of said magnetic tape and also with a second repeatedly reproduced recorded part in succession with the first recorded part, such that said parts overlap each other;

means for repeatedly reproducing said part to be repeatedly reproduced, using an output of said tape counter means and an output of said reproduction length memory means in response to a repeat reproduction instruction signal.

4,446,496

AUTOMATIC REVERSE TAPE RECORDER

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 129,165, Mar. 10, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,708
Claims priority, application Japan, Mar. 22, 1979, 54-33699
Int. Cl.³ G11B *15/02, 15/44*
U.S. Cl. 360—74.1 **5 Claims**

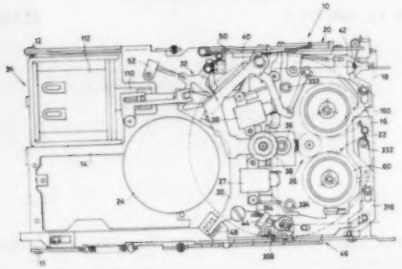
1. In an automatic reverse cassette tape recorder wherein a playback mode is set by the loading of a cassette and, after the

ejection of the cassette by means of an ejection means, a new playback mode is set on a determined one side of the cassette, which comprises: a magnetic tape driving motor selectively for driving a magnetic tape in first and second running directions; an operator actuable recording mode-setting member; a pair of magnetic heads; support means for supporting said pair of magnetic heads spaced from each other; an automatic reverse circuit including an end of tape detecting means for detecting the terminal end of a tape and generating an electrical signal indicating detection of the end of the tape; means responsive to at least one of said end of tape detecting means and said recording mode-setting member for bringing one of the paired magnetic heads to a projected position suitable for contact with a magnetic tape; and cassette ejecting means for ejecting a cassette and for causing a prescribed magnetic head to be brought to said projected position only when the prescribed one of the paired magnetic heads is not in said projected position for contact with the tape, thereby always causing said prescribed magnetic head to be projected to a position suitable for contact with the tape when a cassette is ejected by said ejecting means;

the improvement comprising:

means responsive to operation of said recording mode-setting device for causing said driving motor to operate in only one direction to drive a magnetic tape in said one direction to permit recording on only one side of said cassette;

means coupled to said end of tape detecting means for supplying said electrical signal to said magnetic tape driving



motor for selectively automatically causing said driving motor to run the magnetic tape in the direction opposite to the previous running direction;

an end alarm circuit coupled to said automatic reverse circuit and including a sounding device, said end alarm circuit being selectively actuated upon detection of the magnetic tape end so as to sound said sounding device;

an automatic stop circuit coupled to said automatic reverse circuit and being selectively actuated upon detection of the magnetic tape end so as to stop the magnetic tape driving motor; and

switch means included in said automatic reverse circuit, said switch means being coupled to said recording mode-setting device, to said automatic reverse circuit, to said end alarm circuit and to said automatic stop circuit, said switch means being always operated upon actuation of said recording mode-setting device to always disable said automatic reverse circuit and to always enable at least one of said end alarm circuit and said automatic stop circuit when the tape recorder is set in the recording mode by actuation of said recording mode-setting device, thereby permitting recording on the tape only when running in said one direction and always preventing recording on the tape when the tape runs in the reverse direction of running of the tape, and permitting playback of the tape in both of said first and second tape running directions under the control of said automatic reverse circuit when said recording mode-setting device is not actuated.

4,446,497

VIDEO HEAD DRIVING UNIT WITH NONLINEAR LEAF SPRING FORCE

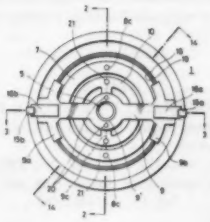
Hiromichi Hirayama, Yokosuka, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 8, 1981, Ser. No. 300,452

Claims priority, application Japan, Sep. 9, 1980, 55-128246[U]; Sep. 10, 1980, 55-128765[U]; Sep. 11, 1980, 55-129516[U]

Int. Cl.³ G11B *21/18, 5/52*

U.S. Cl. 360—109 **16 Claims**



1. A video tape recording and/or reproducing apparatus, comprising:

a rotary drum having a pair of openings at diametrically opposite positions and rotatable about a vertical axis;

a horizontal yoke elongated in a direction transverse to said vertical axis and carrying video transducer heads at opposite ends thereof in said openings respectively;

a leaf spring secured to said rotary drum at first diametrically opposite positions with respect to said vertical axis and further secured to said yoke at second diametrically opposite positions aligned with said first diametrically opposite positions along a line which is perpendicular to the direction of elongation of said yoke for tiltably supporting said yoke about a horizontal axis so that said video heads are vertically movable in said openings, the arrangement of said leaf spring being such that a nonlinear spring force is exerted against said yoke, the spring force being greater when the yoke is tilted within a predetermined range than when the yoke is tilted beyond said range; and

means for tilting said yoke against said spring about said horizontal axis in response to a signal applied thereto to displace said video heads from a horizontal position.

4,446,498

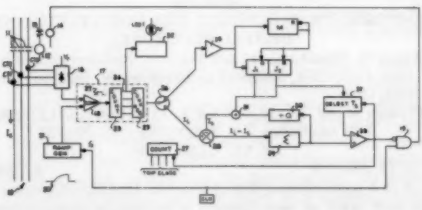
ELECTRONIC CONTROL SYSTEM FOR OVERLOAD RELAY OR THE LIKE

Frederick A. Stich, Milwaukee, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 5, 1982, Ser. No. 365,378

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—87 **28 Claims**



1. An automatic control for a circuit protection device of the type having switch means for opening and closing an electrical

circuit, sensing means for sensing the current flow in the circuit, and an operator for operating the switch means in response to predetermined circuit current characteristics, comprising:

reference means for establishing a time-varying comparison signal;

timer means coupled to said reference means for initiating a comparison period at a sampling frequency fs which is not a harmonic of the frequency of current flowing in the circuit;

comparator means coupled to said reference means, to said timer means and to said sensing means for outputting a first signal in response to the comparison signal exceeding the sensed current flow signal; and

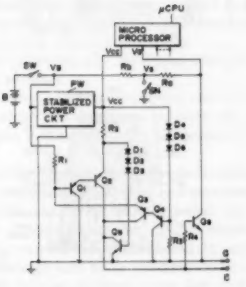
accumulator means coupled to said comparator means for accumulating representations of successive ones of said first signals and outputting a trip signal to cause said operator to automatically open said switch means in response to the accumulated values of said signals exceeding a preselected threshold value.

4,446,499

INPUT PROTECTION CIRCUIT

Satoru Kishimoto; Masaharu Atsumi, both of Kakogawa, and Yoshiaki Sano, Kawasaki, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Fujitsu Limited, Kawasaki, both of, Japan

Filed Jun. 3, 1982, Ser. No. 384,634
Claims priority, application Japan, Jun. 5, 1981, 56-86451
Int. Cl.³ H02H 7/09
U.S. Cl. 361—92 **6 Claims**



3. An input protection circuit, operatively connected to receive an external voltage, for a signal processing circuit having a power supply terminal and a first input terminal, comprising:

a power source switch operatively connected to receive the external voltage, said power source switch providing the external voltage when it is turned ON;

a stabilized power source circuit, operatively connected to said power source switch and the power supply terminal of the signal processing circuit, for providing an output voltage to the power supply terminal of the signal processing circuit;

a first sensor, operatively connected to said power source switch and operatively connected to the first input terminal of the signal processing circuit at a first node;

a first clamping transistor having a first terminal connected at the first node and having second and third terminals;

first means, operatively connected to the second terminal of said first clamping transistor and to said power source switch, for holding said clamping transistor in an ON state until the output voltage of said stabilized power source circuit rises up to a first predetermined value after said power source switch is turned ON;

second means, operatively connected to said stabilized power source circuit, said first clamping transistor, and said first means, for holding said first clamping transistor in an OFF state after the output voltage of said stabilized power source circuit exceeds the first predetermined value after said power source switch is turned ON and until the output voltage of said stabilized power source circuit becomes lower than a second predetermined value; and

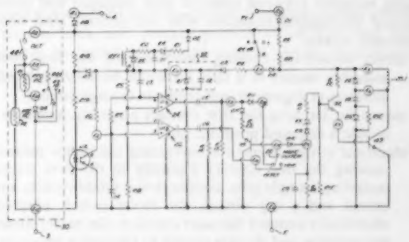
third means, operatively connected to said second means, said power source switch, and said first clamping transistor, for placing said first clamping transistor in the ON state when the output voltage of said stabilized power source circuit becomes lower than the second predetermined value.

4,446,500

REMOTE CONTROL CIRCUIT BREAKER CIRCUIT

Aime J. Grenier, North Attleboro, and Hans G. Hirsbrunner, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,532
Int. Cl.³ H01H 77/06
U.S. Cl. 361—103 **13 Claims**



1. A remote control circuit breaker circuit comprising

a power supply terminal,

a control circuit having first and second paths coupled to the power supply terminal,

a thermally responsive switch connected between a path of the control circuit and ground, the thermally responsive switch adapted to be disposed in a location remote from the remainder of the circuit breaker circuit, an on-off switch serially connected to the path between the path and the power supply terminal, the circuit path having first and second branches in parallel circuit relation with each other, the first branch comprising a first positive temperature coefficient (PTC) of resistance element and an SCR serially connected thereto, a first set of relay contacts coupled to the gate circuit of the SCR to control its state of conduction, the second branch comprising a second positive temperature coefficient (PTC) of resistance whereby when the SCR is in the conductive state the first and second PTC elements are in parallel circuit relation and when the SCR is non-conductive only the second PTC element is adapted to conduct current passing through the on-off switch through the thermally responsive switch to ground,

the control circuit including a light emitting diode,

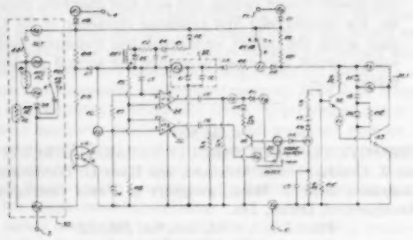
a logic circuit, signal generating means adapted to generate a signal when the light emitting diode is energized,

electromotive motor means including a solenoid and a serially connected solenoid switch, the signal generating means of the logic circuit coupled to solenoid switch and adapted to control its state of conductivity, current adapted to pass through the solenoid when the solenoid switch is rendered conductive by receiving a signal from the signal generating means.

4,446,501
CIRCUIT CONTROL SYSTEM

Robert W. Peterson; Aime J. Grenier, both of North Attleboro, and Hans G. Hirshrunner, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,535
Int. Cl.³ H02H *1/00*; H01H *71/10*
U.S. Cl. 361—114 **8 Claims**



1. A circuit control system comprising first and second load contact assembly means, the first load contact assembly means being movable between contacts reset engaged and contacts tripped disengaged positions with the second load contact assembly means,

motor means for causing movement of the first contact assembly means in a first direction to alternately effect contacts engagement and contacts disengagement,

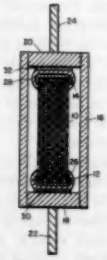
means for latching the first contact assembly means in the contacts engaged position, and

electrical circuit means for energizing the motor means for moving the first contact assembly in the first direction including a single pole, double throw mode switch, a reset circuit and a trip circuit, the mode switch adapted to electrically connect the reset circuit to the motor means in one position and the trip circuit to the motor means in the other position, alternate movement of the first contact assembly means between the contact reset engaged position and the contacts disengaged tripped position causing the mode switch to move from one position to the other.

4,446,502
METALLURGICAL CONTACTS IN HERMETICALLY SEALED GLASS ENCAPSULATED CERAMIC CAPACITORS

Otmar H. Boser, Scarsdale, and Richard C. Sweet, North Tarrytown, both of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,041
Int. Cl.³ H01G *1/14, 4/10*
U.S. Cl. 361—308 **6 Claims**

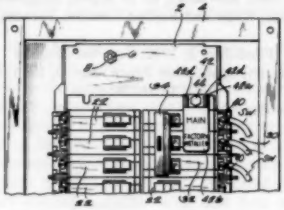


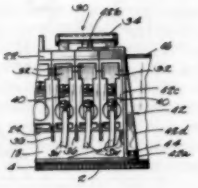
1. An improved hermetically sealed, glass-encapsulated capacitor assembly including a monolithic ceramic chip capacitor with conductive end terminations of silver, a pair of flexible metal leads each with an enlarged inflexible end cap having an end face in proximity with a respective conductive end termination of said capacitor, said proximate component ends and end caps being of dissimilar metals, a glass sleeve surrounding said component and end caps with direct physical glass-to-metal contact between said sleeve and the lateral surfaces of said end caps, said physically contacting glass and metal surfaces being positioned to be heat sealed, wherein the improvement comprises: a nickel coating over said silver end terminations; and a coating of silver over said nickel plating, said coatings selected to effect a brazing between said end terminations and said end caps when said assembly is heat sealed.

4,446,503
ELECTRICAL PANELBOARD WITH MAIN BREAKER HOLD-DOWN

Donald A. Link, Hubertus, and John A. Swessel, Jr., Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 11, 1982, Ser. No. 338,798
Int. Cl.³ H02B *1/02*
U.S. Cl. 361—346 **10 Claims**





1. In an electrical panelboard having a plurality of plug-in circuit breakers, the combination comprising:

a panel;

a mounting rail on said panel for mounting one end of said circuit breakers;

insulating means mounted on said panel;

a plurality of bus bars supported by said insulating means, said bus bars being transversely spaced with respect to said mounting rail extending along said panel parallel to said mounting rail and said bus bars having first plug-in connector means spaced at intervals along their length;

a multi-pole main circuit breaker having a plurality of second plug-in connector means cooperably engagable with respective ones of said first plug-in connector means, one end of said multi-pole main circuit breaker being mounted to said mounting rail and said second plug-in connector means being engaged with respective ones of said first plug-in connector means, said main circuit breaker having wire receiving terminals for connecting said main circuit breaker to a source of electrical power; and

hold-down means secured to said panel and extending forwardly from said panel along a side of said main circuit breaker and overlying said main circuit breaker trans-

versely of a line extending between said plug-in connector means and said mounting rail for preventing removal of said main circuit breaker to thereby disconnect said first and second plug-in connections.

4,446,504

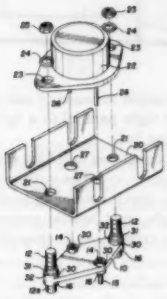
MOUNTING MEANS WITH SOLDERABLE STUDS

William D. Jordan; Howard G. Hinshaw, both of Dallas, and Donald L. Clemens, The Colony, all of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Continuation of Ser. No. 271,600, Jun. 8, 1981, abandoned. This application Sep. 13, 1983, Ser. No. 532,085

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **9 Claims**



1. A device mounting a semiconductor package to a circuit board, the package having conductive pins extending from the package, the mounting device comprising:

a body formed of electrically insulating material having top and bottom surfaces;

said body including apertures receiving the conductive pins to provide electrical insulation between the pins and to allow the pins to be electrically connected to the circuit board; and

stud means having first and second ends mounting the semiconductor package to said body and mounting said body to the printed circuit board, such that the package is electrically connected to the circuit board, said stud means being carried by and secured to said body and extending through said body substantially transversely to said top and bottom surfaces, such that said first end of said stud means extends substantially perpendicularly from said top surface of said body and receives the semiconductor package and said second end of said stud means extends substantially perpendicularly from said bottom surface of said body and is electrically connected to the circuit board, such that said body insulates the semiconductor package from the circuit board while providing selective electrical connection between the circuit board and the semiconductor package through said stud means.

4,446,505

ELECTRICAL CONNECTOR FOR INTERCONNECTING PRINTED CIRCUIT BOARDS

William B. Long, Camp Hill, and Suel G. Shannon, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 22, 1982, Ser. No. 360,503

Int. Cl.³ H01R *23/68, 9/09*

U.S. Cl. 361—413 **5 Claims**

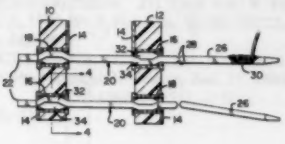
1. An electrical connector for electrical connection with aligned metal-lined holes in spaced printed circuit boards comprising:

a connector pin having contact sections defining a leading and one or more following compliant contact sections;

each of said compliant contact sections having two legs extending outwardly in opposite directions from each other along and on opposing sides of a plane associated with said each of said compliant contact sections extending through an axis of said connector;

each of said two legs of each said compliant contact section having a contact portion for contacting a surface of a metal-lined hole of a printed circuit board;

each of said associated planes having an orientation at an angle to others of said associated planes such that said



contact portion of each of said legs is not aligned with any other of said contact portions along the axis of said connector so that when each one of said following compliant contact sections is disposed to rest within an associated metal-lined hole of a printed circuit board after said connector is inserted into a plurality of spaced printed circuit boards, each said contact portion of each of said legs makes electrical connection with a virgin area of said metal-lined hole.

4,446,506

PHOTOGRAPHIC LIGHT DIFFUSER

Raymond G. Larson, Huntington Beach, Calif., assignor to Larson Enterprises, Inc., Fountain Valley, Calif.

Filed Nov. 12, 1982, Ser. No. 440,749

Int. Cl.³ G03B *15/02*

U.S. Cl. 362—17 **14 Claims**

1. A photographic light diffusing device and the like comprising the combination:

a mounting member adapted for cooperative and releasable association with a light source;

a plurality of support members releasably supported from said mounting member; and

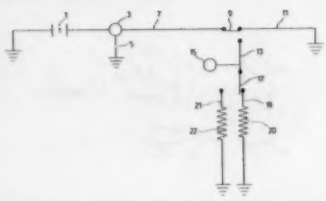
at least one segment panel adapted for releasable, supported engagement with said support members and said mounting member, said segment panel in the supported state forming selected polygonal configurations to direct and alter light emitting from a light source with which said device is utilized.

4,446,507

AUTOMOBILE HEADLIGHT CONTROL SYSTEM

Ronald M. Daniels, 112 Westhill Rd., Elliot Lake, Canada (P5A 1A7)

Filed Mar. 29, 1983, Ser. No. 442,009
Int. Cl.³ F21V *19/04*
U.S. Cl. 362—20 **8 Claims**



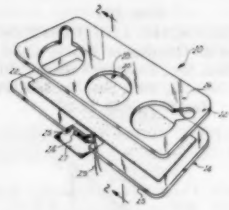
1. A lighting system for use on a vehicle, said system comprising a first and a second set of low beam driving lights, a set of high beam driving lights, first switching means for switching from said low beam driving lights to said high beam driving lights and second switching means for switching between said first and second sets of low beam driving lights in the event of failure of one of said low beam sets, and indicating means interiorly of the vehicle to indicate such failure.

4,446,508

EDGE LIGHTED ARTICLE HOLDER

Michael R. Kinzie, Mishawaka, Ind., assignor to Plast-Ad, Inc., Mishawaka, Ind.

Filed Jan. 17, 1983, Ser. No. 458,299
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—31 **9 Claims**



1. In an article holder having an upper wall and a lower wall connected by a web, opening means in said upper wall defined by an edge for receiving an article, said lower wall adapted to support said article when the article is placed within said opening means, said upper and lower walls and said web formed of light transmitting material, the improvement in said article holder comprising a lighting element means secured within the plane of one of said upper and lower walls and said web for transmitting light through said one wall or web to illuminate said opening means edge in the upper wall.

4,446,509

FLASHLIGHT WITH COMPASS MEANS INTEGRAL THERETO

Charles E. Thomas, 36954 Sugar Ridge Rd., North Ridgeville, Ohio 44039

Filed Feb. 28, 1983, Ser. No. 451,247
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—184 **1 Claim**

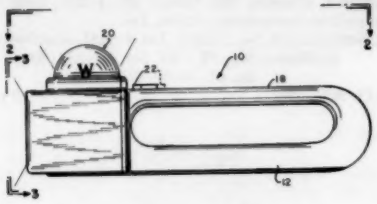
1. A combination of the class described involving an electric flashlight and magnetic compass, comprising:

a body structure preinjection molded from a material have shock resistant and electrical insulating characteristics;

an elongated tubular cavity for receiving a plurality of batteries;

a second cavity adopted to receive a bell type lens and a light emitting bulb;

a magnetic compass including an internal light emitting source connected in series with said light emitting bulb,



said compass position forward of said body structure and having a line of sight parallel to a light beam emitted by said light emitting bulb;

switch means for connecting said light emitting bulb and said light emitting source in series with said batteries; and

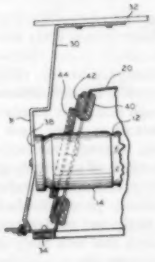
said body structure further defining handle means for holding said flashlight, said handle means and battery container being one continuous U-shaped tube.

4,446,510

REFLECTOR SEALING APPARATUS

George K. Wagner, Horn Lake, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,237
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **5 Claims**

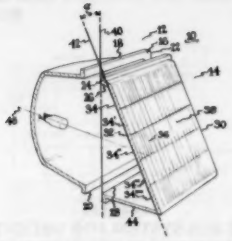


1. In an outdoor luminaire having a reflector with an elongated opening in the reflector adjacent one end thereof for receiving a generally cylindrical socket therethrough, sealing structure for said opening to seal the space between the socket and the reflector, said structure including a first grommet-like gasket enclosing the periphery of said opening, a sealing plate with its area greater than said opening, an aperture in said plate for receiving the socket therethrough with a clearance fit, said plate being otherwise imperforate, a gasket member affixed to said plate, said gasket member having a passage therethrough to receive said socket with a negative allowance fit, and said plate including a pair of spaced apart tabs for resiliently engaging said reflector adjacent said opening to grip and compress the gasket between the plate and the reflector whereby to cover and seal said opening with said gasket member externally of the socket.

4,446,511
AUTOMOTIVE LAMP UNIT

Robert W. Sands, Hudson, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 130,254, Mar. 14, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 386,843
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **11 Claims**

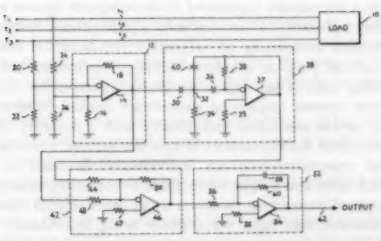


1. An improved all glass sealed beam vehicle headlamp having a glass reflector directly fusion sealed at an outer sealing rim to a corresponding sealing rim of a single glass lens member to produce a hermetically sealed enclosure, said single lens member having a smoother exterior surface with an inner surface utilizing a single prism element construction with rows of longitudinally extending prism elements to project light being transmitted directly from said reflector therethrough for a substantial distance from the vehicle, wherein the improvement comprises shaping the single lens member to lie in a non-vertical direction when sealed to said reflector member while extending the length of the prism elements by a distance related to the angle of inclination for said single lens member from the vertical direction in order to project approximately the same light beam pattern as obtained with a lens member aligned in the customary vertical direction.

4,446,512
CIRCUITRY FOR SINE WAVE RECONSTRUCTION

Willard B. Jarvinen, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Jan. 18, 1982, Ser. No. 340,400
Int. Cl.³ H02M *5/00*
U.S. Cl. 363—39 **4 Claims**



1. Circuitry for producing a sine wave output signal representative of a polyphase sine wave source voltage from signals representing line voltages taken from lines connecting the source to a load comprising:

(a) differential amplifier means to provide a first signal representing an actual voltage existing between two phases of the line voltages;

(b) means including an operational amplifier responsive to said first signal to provide a second signal representing only higher frequency components of said first signal;

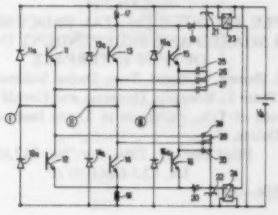
(c) operational amplifier means to combine said first and second signals to develop a combined signal; and,

(d) means to filter said combined signal to provide said sine wave output signal.

4,446,513
DC/AC BRIDGE INVERTER INCLUDING A SWITCHING AID AND INDUCTIVE ENERGY RECOVERY CIRCUIT

Daniel Clénet, Grasse, France, assignor to La Telemecanique Electrique, France

PCT No. PCT/FR81/00074, 371 Date Feb. 9, 1982, 102(e) Date Feb. 9, 1982, PCT Pub. No. WO81/03722, PCT Pub. Date Dec. 24, 1981
PCT Filed Jun. 12, 1981, Ser. No. 359,712
Claims priority, application France, Jun. 13, 1980, 80 13146
Int. Cl.³ H02M *7/537, 7/515*
U.S. Cl. 363—132 **4 Claims**



3. A DC/AC inverter device comprising:

a supply source having first and second DC supply terminals;

a plurality of paired transistors mounted in a transistor bridge having first and second pole terminals, each pair of transistors having a junction point;

a load having phase input terminals, each connected to a junction point of one respective pair of transistors;

a plurality of paired recovery diodes mounted in a diodes bridge having first and second pole terminals, each pair of recovery diodes having a junction point connected to a junction point of a corresponding pair of transistors;

a first inductor mounted between said first pole terminal of the transistor bridge and said first pole terminal of the diodes bridge;

first connecting circuit means having an input terminal connected to the first terminal pole of the transistor bridge and an output terminal connected to the first DC supply terminal, said first connecting circuit means comprising in series a first diode having a first electrode connected to the first terminal pole of the thyristor bridge, and a second electrode, and a first storage capacitor having a first electrode connected to the first DC supply terminal and a second electrode connected to the second electrode of the said first diode;

a first plurality of switching aid capacitors, each comprising a first electrode connected to the second electrode of the first diode and a second capacitor connected to the junction point of a corresponding pair of transistors of the transistor bridge;

first low voltage-high voltage means having two input terminals respectively connected to the first and second capacitor electrodes of the first storage capacitor and two output terminals respectively connected to the first and second DC supply terminals;

a second inductor mounted between said second pole terminal of the thyristor bridge and said second pole terminal of the diodes bridge;

a second conducting circuit means having an input terminal connected to the second terminal pole of the transistor bridge and an output terminal connected to the second DC supply terminal, said second connecting circuit com-

prising in series a second diode having a first diode electrode connected to the second terminal pole of the thyristor bridge and a second diode electrode, and a second storage capacitor having a first capacitor electrode connected to the second DC supply terminal and a second capacitor electrode connected to the second diode electrode of the said second diode;

a second plurality of switching aid capacitors, each comprising a first capacitor electrode connected to the second diode electrode of the second diode and a second capacitor electrode connected to the junction point of a corresponding pair of transistors of the transistor bridges;

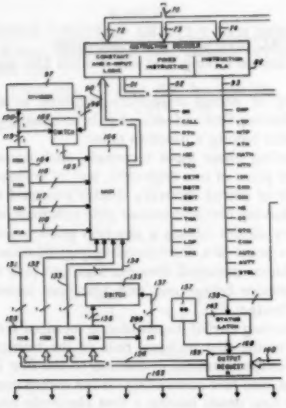
a second low voltage-high voltage having two input terminals respectively connected to the first and second capacitor electrodes of the second storage capacitor and two output terminals respectively connected to the first and the second DC supply terminals.

4,446,514

MULTIPLE REGISTER DIGITAL PROCESSOR SYSTEM WITH SHARED AND INDEPENDENT INPUT AND OUTPUT INTERFACE

Sammy K. Brown, Midland, Tex.; Duane Solimeno, Newington, Conn.; Peter L. Koeppen, Houston, and Gerald Rogers, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1980, Ser. No. 217,480
Int. Cl.³ G06F *9/16*
U.S. Cl. 364—200 **13 Claims**



1. An electronic digital processor system comprising:

memory means for storage of data and commands which define operations on said data;

arithmetic and logic means for performing said operations on said data;

first and second independent and simultaneously operable processing units for executing said commands on said data;

control circuitry for obtaining from said memory said commands and said data and transferring said commands to said first and said second processing units;

first input means for providing external data to said first processing unit;

first output means for the external transmission of data from said first processing unit;

second input means for providing external data to said second processing unit;

second output means for the external transmission of data from said second processing unit;

third output means for the external transmission of data from said first and said second processing units;

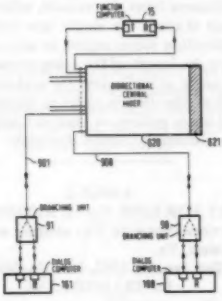
a plurality of data paths that couple said first processing unit to said memory means, said arithmetic and logic means, said first input means, said first output means, and said third output means; and couples said second processing unit to said memory means, said arithmetic and logic means, said second input means, said second output means, and said third output means.

4,446,515

PASSIVE BUS SYSTEM FOR DECENTRALLY ORGANIZED MULTI-COMPUTER SYSTEMS

Anton Sauer, Germering, and Hans H. Witte, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 31, 1980, Ser. No. 221,770
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001638
Int. Cl.³ G06F *3/04, 15/16*; G02B *5/14*
U.S. Cl. 364—200 **23 Claims**



1. In a decentrally organized multi-computer system incorporating a plurality of function units, a passive bus communication system comprising an internal communication function unit for carrying on all data exchange operations between individual ones of said function units, said passive bus communications system employing exclusively optical transmission means, means associated individually with a plurality of said function units for the control of said bus system, a plurality of optical transmitter-receivers individually allocated to said function units and a light wave guide for optically connecting said optical transmitter-receivers to all other optical transmitter-receivers, said light wave guide being individually allocated to each said transmitter-receiver by means of an optical mixer, said optical mixer comprising a bidirectional mixer operating as the central mixer in a central level of the passive bus system, and including a plurality of transmission-reception lines each of which is respectively connected between the branching point of a branching unit and one of a plurality of terminals of a first group of terminals of the central mixer, a plurality of auxiliary computers, means for connecting said auxiliary computers to terminals of said branching units, and means for connecting at least one function unit directly to a plurality of terminals of a second group of terminals of the central mixer without using a branching unit.

4,446,516

DATA COMPACTION SYSTEM WITH CONTIGUOUS STORAGE OF NON-REDUNDANT INFORMATION AND RUN LENGTH COUNTS

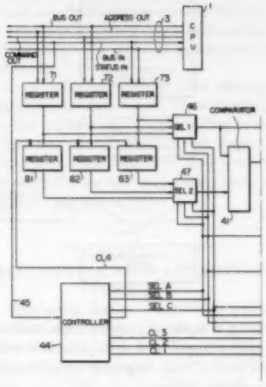
Toshifumi Nishimura, Minamiashigara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

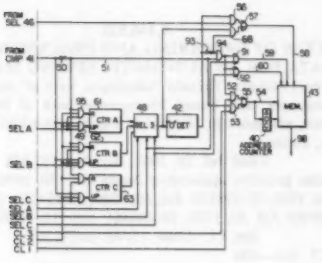
Filed Mar. 25, 1981, Ser. No. 247,265

Claims priority, application Japan, Mar. 31, 1980, 55-42673

Int. Cl.³ G06F *3/00, 5/00, 7/02;* H03K *13/00*

U.S. Cl. 364—200 **5 Claims**





1. An information storing method for storing in a memory the past record of a plurality of information signals generated in time sequence, said method comprising the steps of:

generating a plurality of information signals in time sequence;

comparing a newly-generated information signal and the previously-generated information signal as each information signal is generated;

incrementing a count when coincidence is obtained at said comparing step;

writing each newly-generated information signal at a storage location in said memory next to the storage location of the previously-generated information signal when coincidence is not obtained at said comparing step at a time when said count is zero;

writing the value of said count at a storage location in said memory next to the storage location of said previously-generated information signal when coincidence is not obtained at said comparing step at a time when said count is not zero and then writing said newly-generated information signal at a storage location in said memory next to the storage location where the value of said count is stored; and

clearing said count to zero when the value of the count has been stored in said memory.

4,446,517

MICROPROGRAM MEMORY WITH PAGE ADDRESSING AND ADDRESS DECODE IN MEMORY

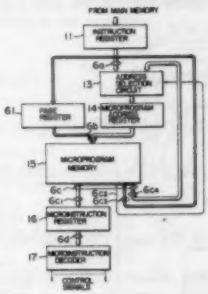
Koyo Katsura, and Hideo Maejima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,608

Claims priority, application Japan, Jun. 2, 1980, 55-72715; Dec. 5, 1980, 55-170942; Mar. 20, 1981, 56-39593

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 **14 Claims**



1. A microprogram control method for use in a system in which a microinstruction of a microprogram is read out of a corresponding address of a microprogram memory in accordance with an instruction read out of a main memory or an externally-supplied instruction, and wherein said microinstruction is decoded to generate an operation control signal to control a processing unit, said method comprising the steps of;

dividing said microprogram memory into pages each consisting of a plurality of words;

designating a selected page of said microprogram memory on the basis of a signal from a page register;

controlling the content of said page register by a microprogram stored in said microprogram memory;

designating an address in the designated and selected page of said microprogram memory on the basis of a signal from an inner page address designating register into which the content of an instruction register containing said instruction can be read directly;

determining the designated and selected page as a decode area of a signal from the instruction register which stores said instruction read out of a main memory or an externally-supplied instruction; and

decoding the instruction in said microprogram memory.

4,446,518

MICROPROGRAMMED CONTROL UNIT WITH MULTIPLE BRANCH CAPABILITY

Angelo Casamatta, Cornaredo, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 9, 1981, Ser. No. 319,811

Claims priority, application Italy, Dec. 18, 1980, 26746 A/80

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 **4 Claims**

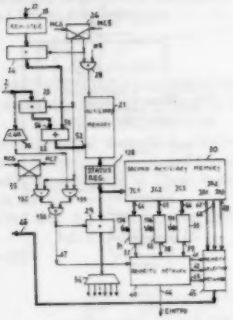
1. A microprogrammed control unit with multiple branch capability comprising a main control memory, an addressing register connected to the addressing inputs of said main control memory, a main output register connected to the outputs of said main control memory, a microcommand decoder connected to the outputs of said main output register, an addressing network for generating sequential addresses and absolute or relative, conditioned or unconditioned, jump addresses, said

addressing network being controlled by microcommands received from outputs of said decoder, said microprogrammed control unit further comprising:

a first auxiliary read/write memory having address inputs and outputs and addressed by output signals from said addressing register and storing first binary codes at addressable locations;

an auxiliary output register connected to the outputs of said first auxiliary memory and storing a first binary code read out from said first auxiliary memory;

a second auxiliary read/write memory having addressable locations and addressed by said first binary code stored in said auxiliary output register and storing at each addressable location a plurality of condition selection codes and a plurality of jump addresses;



a plurality of condition selection networks, each one having first inputs receiving a plurality of condition signals, second selection inputs receiving one of said condition selection codes read out from said second memory, and providing to an output one condition signal out of said plurality;

a priority selection network having a plurality of inputs, each one connected to the output of one of said condition selection networks and receiving said one condition signal, and providing to a plurality of outputs an address selection code; and

a jump address selection network having control inputs receiving said address selection code, a plurality of input sets connected to a plurality of output sets of said second auxiliary memory and receiving a plurality of jump addresses and an output set connected to said addressing network and providing a jump address selected out of said plurality received at said input sets.

4,446,519

METHOD AND APPARATUS FOR PROVIDING SECURITY FOR COMPUTER SOFTWARE

David C. Thomas, Mesa, Ariz., assignor to Corban International, Ltd., Anguilla

Filed May 26, 1981, Ser. No. 266,724

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—300 **2 Claims**

1. A method for providing security for software used in a computer, which includes

a working memory, and

a program stored in said memory,

which method includes, in combination, the steps of:

(a) loading a program into said working memory, which program includes instructions for

(i) generating preselected coded interrogation signals,

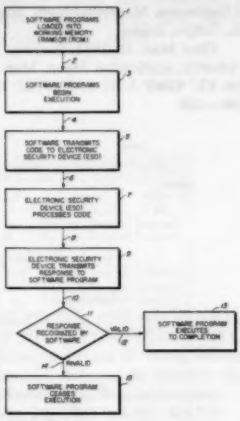
(ii) assessing response signals thereto, and

(iii) generating command signals according to preselected security criteria;

(b) commencing execution of said program;

(c) transmitting said coded interrogation signals from said memory to an electronic security device which automatically processes said received signals and generates a coded response thereto;

(d) transmitting said coded response to said memory; and


SOFTWARE PROGRAMS LOADED INTO WORKING MEMORY FROM ROM
SOFTWARE PROGRAMS BEGIN EXECUTION
SOFTWARE TRANSMITS CODE TO ELECTRONIC SECURITY DEVICE (ESD)
ELECTRONIC SECURITY DEVICE (ESD) PROCESSES CODE
ELECTRONIC SECURITY DEVICE TRANSMITS RESPONSE TO SOFTWARE PROGRAM
RESPONSE RECOGNIZED BY SOFTWARE
VALID
INVALID
SOFTWARE PROGRAM EXECUTES TO COMPLETION
SOFTWARE PROGRAM CEASES EXECUTION

(e) generating a command signal from said memory which causes said computer to complete the execution of said program only if said response signal satisfies said preselected security criteria.

4,446,520

PROCESS OF PREPARING AND PROCESSING SEWING DATA FOR AN AUTOMATIC SEWING MACHINE

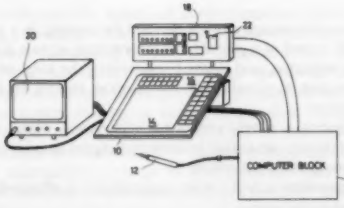
Katsunori Shigeta; Takashi Nakamura, both of Aichi; Hisaichi Maruyama, and Yasuji Matsumoto, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 287,831

Claims priority, application Japan, Jul. 30, 1980, 55-104557; Jul. 30, 1980, 55-104558; Jul. 30, 1980, 55-104559; Jul. 30, 1980, 55-104560; Jul. 30, 1980, 55-104561; Sep. 12, 1980, 55-126678

Int. Cl.³ G06F *15/46*; D05B *3/02*

U.S. Cl. 364—400 **5 Claims**



1. A method for preparing sewing data and performing sewing operations in accordance with the prepared data, comprising the steps of:

moving a hand-held stylus pen upon a data input board along a locus corresponding to a desired sewing pattern;

storing in a random-access memory incremental data values representing said locus;

displaying upon a cathode-ray tube monitor a pattern corresponding to said desired sewing pattern by reading out said incremental data values from said random-access memory in sequence and accumulating said incremental data values from a reference position upon a display sur-

face of said cathode-ray tube monitor so that said pattern is clearly displayed for viewing by an operator;

editing said incremental data values stored in said random-access memory to correct any errors noted in the pattern displayed on said cathode-ray tube monitor;

transferring the edited incremental data values from said random-access memory to a nonvolitile data storing means along with incremental data values of other sewing patterns similarly prepared, each of said patterns being addressable only by a corresponding top address, said top addresses being stored sequentially in a predetermined portion of said nonvolitile data storing means;

positioning a needle of a sewing machine head at a predetermined start location of a selected one of said patterns on fabric to be sewn;

reading out from said nonvolatile data storing means in sequence incremental data values for said selected pattern by applying the top address corresponding to said selected pattern to said nonvolatile data storing means; and

relatively positioning said fabric and said sewing needle in accordance with the incremental data values so read out to perform a sewing operation.

4,446,521

IMAGE RECONSTRUCTION APPARATUS AND PROCESS

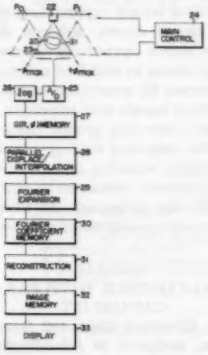
Tamon Inouye, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 20, 1981, Ser. No. 245,758

Claims priority, application Japan, Mar. 28, 1980, 55-38871

Int. Cl.³ G06F *15/42*; G01N *23/00*

U.S. Cl. 364—414 **8 Claims**



1. In an image reconstruction system, the method for reconstructing a slice image of a subject within an area under examination comprising the steps of:

(a) projecting rays at a scan angle through a slice of the subject and detecting the rays penetrating through the slice to generate data signals representing the intensities of said detected rays;

(b) repeating step (a) for a plurality of different scan angles ϕ located in a sector scan of less than 180° centered about a point in said area to obtain projection data $G(R, \phi)$ representative of the intensity and direction of the detected data signals over the sector scan of less than 180°;

(c) performing a parallel displacement of the projectin data $G(R, \phi)$ in the direction of the original angles ϕ according to the equation $R' = R + \alpha \cos \phi$ to transfer the projection data $G(R, \phi)$ into displaced projection data $G(R', \phi)$ that represents data projected by a constant α to an area within a specified region spaced from the origin of the subject so that R' is greater than r, the radius of the area being scanned;

(d) calculating the Fourier coefficient $g_n(R')$ according to the equation

$$gn(R') = \frac{1}{2\pi} \int_{-\phi max}^{\phi max} g(R', \phi) e^{-in\phi} d\phi;$$

(e) calculating the Fourier coefficient $f_n(r')$ according to the equation

$$fn(r') = \frac{-1}{\pi} \frac{d}{dr'} \int_{r'}^{r'max} \frac{gn(R')\ Tn(R'/r')}{\sqrt{(R'/r')^2 - 1 \cdot R'}} dR';$$

(f) reconstructing a slice image representative of the entire subject according to the equation

$$f(r', \theta') = \sum_{n=-nmax}^{nmax} fn(r') e^{in\theta'}$$

where n is an integer denoting the order of the Fourier series expansion; and

(g) displaying the reconstructed slice image.

4,446,522

METHOD OF PREVENTING SKID OF WHEELS OF A VEHICLE

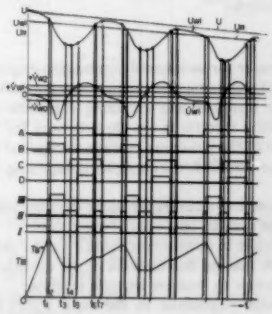
Makoto Sato, Kamifukuoka; Taiji Ohmori, and Yoshikazu Tsuchiya, both of Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 1,213, Jan. 5, 1979. This application Oct. 16, 1980, Ser. No. 198,165

Claims priority, application Japan, Jan. 18, 1978, 53-3847; Jan. 18, 1978, 53-3850; Jan. 24, 1978, 53-6405; Mar. 15, 1978, 53-30192

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **11 Claims**



1. An anti-skid method of preventing skid of wheels of a vehicle comprising: detecting the peripheral speed of a wheel of a vehicle and picking it up as a wheel-speed signal (Uwi), detecting the speed of the vehicle, setting from the detected vehicle speed a first reference wheel-speed signal (U_R) and a second reference wheel-speed signal (Vwo) of a level lower than that of said first reference wheel-speed (U_R) for comparison with said wheel-speed signal (Uwi), deriving a wheel-acceleration signal (Uwi) from said wheel-speed signal (Uwi), setting a reference wheel-deceleration signal (−Vwo) representative of a negative wheel acceleration for comparison with said wheel-acceleration signal(Uwi), comparing, during braking, said wheel-speed signal (Uwi) with said first and second reference wheel-speed signals (U_R, Vwo) and also said wheel-acceleration signal (Uwi) with said reference wheel-deceleration signal (−Vwo), and controlling a braking torque (T_B)

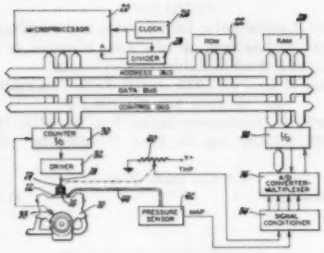
applied to said wheel such that said brake torque (T_B) is maintained constant from the time when the level of said wheel-acceleration signal (Uwi) falls below the level of said reference wheel-deceleration signal (−Vwo) if the level of said wheel-speed signal (Uwi) is higher than that of said first reference wheel-speed signal (U_R), and thereafter, said brake torque (T_B) is reduced from the first instant when the level of said wheel-speed signal (Uwi) falls below the level of said first reference wheel-speed signal (U_R) if the level of said wheel-acceleration signal (Uwi) remains below the level of said reference wheel-deceleration signal (−Vwo), or at the second instant when the level of said wheel-speed signal (Uwi) falls below the level of said second reference wheel-speed signal (Vwo), the reduction of said brake torque (T_B) taking place at an earlier one of said first and second instants.

4,446,523

MASS AIR FLOW METER

Paul E. Reinke, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1981, Ser. No. 321,117
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—431.05 **2 Claims**



1. An air meter for an internal combustion engine having an intake manifold, an induction passage opening from an air inlet to the intake manifold and including a throttle bore and a variable position throttle in the throttle bore for varying the effective area of the induction passage to regulate the air flow into the intake manifold, the air meter comprising, in combination:

means effective to measure the value P_1 of the pressure in the induction passage upstream of the throttle;

means effective to measure the value P_2 of the pressure in the induction passage downstream of the throttle;

means effective to measure throttle position;

circuit means responsive to the ratio P_2/P_1 effective to provide a schedule of values D that substantially satisfies the expression $C_{SS}\sqrt{1-P_2/P_1}$ for subsonic air flow through the induction passage opening defined by the throttle and substantially equal to C_S for sonic air flow through the induction passage opening defined by the throttle, where C_{SS} is a pressure ratio dependent discharge coefficient and C_S is the sonic flow discharge coefficient;

circuit means responsive to the measured throttle position effective to provide a schedule of values A representing the effective area of the induction passage defined by the throttle;

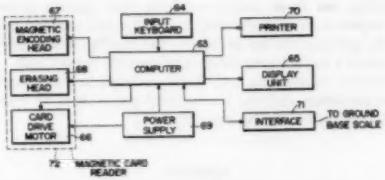
means responsive to the scheduled values of D and A and the measured value P_1 effective to provide an air flow signal that substantially satisfies the expression $A \cdot K_1 \cdot P_1 \cdot D$ where K_1 is a constant, the air flow signal being a substantial measure of the mass rate of air flow inducted into the intake manifold through the induction passage.

4,446,524

APPARATUS FOR LOADING AND UNLOADING AN AIRCRAFT

Hans-Joachim Wendt, Buxtehude, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 161,035, filed June 19, 1980, abandoned, which was a continuation-in-part of Ser. No. 002,062, filed Jan. 9, 1979, U.S. Pat. No. 4,225,926.
This application field Nov. 2, 1981. Ser. No. 317,143
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2802003; Jul. 3, 1979, 2926870
Int. Cl.³ G01M *1/12*
U.S. Cl. 364—463 **9 Claims**



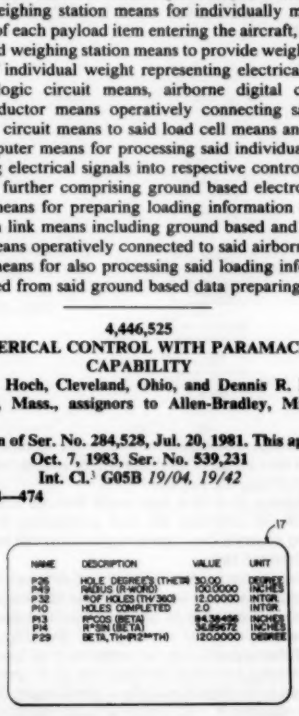
1. An apparatus for loading and unloading an aircraft and for ascertaining the weight of the load, comprising weighing station means arranged within the aircraft fuselage in such position that the weight of any item of payload to be added to the actual weight of the aicraft must operatively and individually pass said weighing station means for individually measuring the weight of each payload item entering the aircraft, load cell means in said weighing station means to provide weight data in the form of individual weight representing electrical signals, electronic logic circuit means, airborne digital computer means, conductor means operatively connecting said electronic logic circuit means to said load cell means and to said digital computer means for processing said individual weight representing electrical signals into respective control signals, said system further comprising ground based electronic data preparing means for preparing loading information data and transmission link means including ground based and airborne data link means operatively connected to said airborne digital computer means for also processing said loading information data received from said ground based data preparing means.

4,446,525

NUMERICAL CONTROL WITH PARAMACRO CAPABILITY

Thomas M. Hoch, Cleveland, Ohio, and Dennis R. Kuligren, Holliston, Mass., assignors to Allen-Bradley, Milwaukee, Wis.

Continuation of Ser. No. 284,528, Jul. 20, 1981. This application Oct. 7, 1983, Ser. No. 539,231
Int. Cl.³ G05B *19/04, 19/42*
U.S. Cl. 364—474 **6 Claims**


17
NAME DESCRIPTION VALUE UNIT
P26 HOLE DEGREES (THETA 30.00 DEGREES
P49 RADIUS (R-WORD) 100.0000 INCHES
P32 #OF HOLES (TH/360) 12.00000 INTGR
P10 HOLES COMPLETED 2.0 INTGR
P13 R*COS (BETA) 94.36496 INCHES
P14 R*SIN (BETA) 36.95675 INCHES
P29 BETA, TH+P12**TH) 120.0000 DEGREES

1. A numerical control system for directing a machine tool to machine a part which comprises:

means for storing a part program comprises of a first set of part program instructions;

processor means coupled to the part program storage means

and being operable to execute the part program instructions to thereby direct the machining of a part;

means coupled to the processor for storing a macroprogram comprised of a second set of part program instructions containing parameters;

parameter table storage means coupled to the processor means for storing a set of parameter values;

wherein the processor means includes,

(a) parameter assignment means which interprets parameter assignment codes in part program instructions of either said first or second sets and which operates in response to such codes to designate a parameter and to store a value for the designated parameter in said parameter table storage means,

(b) macroprogram execution means which interprets macro call instructions in the first set of part program instructions to execute the second set of part program instructions as the part defined by the sets of part program instructions is being machined, and

(c) parameter evaluation means which is responsive to a parameter contained in a part program instruction of either the first or second sets being executed by the processor means to read the value for that parameter from the parameter table storage means and substitute it for said parameter in said part program instruction as the part program instruction is being executed to machine a part.

4,446,526

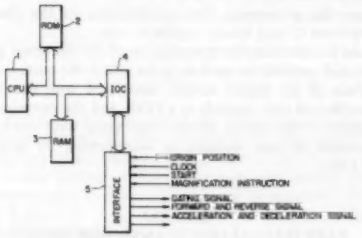
CONTROL CIRCUIT FOR ZOOMING DEVICE

Hisao Iwanade, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,646

Int. Cl.³ G02B 7/11

U.S. Cl. 364—525 **4 Claims**



1. A control circuit for a zooming device, comprising:

a microcomputer;

memory means coupled to said microcomputer for storing predetermined program steps;

an interface device coupled to said microcomputer;

a zooming operating circuit coupled to said interface device, said interface device operatively coupling an operating circuit to said microcomputer, said operating circuit comprising an integrator, an input of which is coupled to an acceleration/deceleration signal output of said interface device; a voltage controlled oscillator having a frequency-determining input coupled to an output of said integrator, an output of said voltage controlled oscillator forming a clock pulse signal which is coupled through said interface device to said microcomputer; an AND gate having a first input coupled to said output of said voltage controlled oscillator and a second input receiving a gating signal from said interface device; a driver having a direction input coupled to a forward/backward rotation signal from said interface device and a clock input coupled to an output of said AND gate; a pulse motor operated in response to an output of said driver; a potentiometer for setting a magnification specifying signal coupled to said interface device; a photosensor for determining a position of said zooming device for producing an origin position signal coupled to said interface device; and a start switch for producing a start signal coupled to said interface device;

wherein, said predetermined program steps include steps of setting said zooming device in an initial state; sensing the presence of said start signal; after said start signal is sensed, reading said magnification specifying signal; comparing said magnification specifying signal with a present zoom position; determining a movement pulse number in accordance with a difference between said magnification indication value and said present value; determining a state of said forward/backward rotation signal in accordance with said difference; determining a state of said acceleration/deceleration signal in accordance with said movement pulse number; supplying said acceleration/deceleration signal, said forward/backward rotation signal and said gating signal to said interface; counting the number of pulses on said output of said voltage controlled oscillator; terminating said gating signal once a counted number of said pulses corresponds to said movement pulse number.

4,446,527

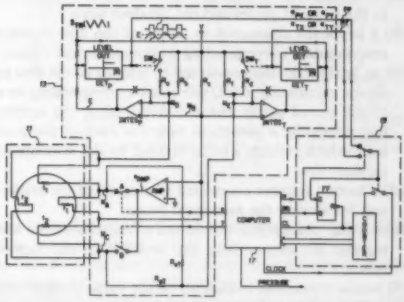
HIGH ACCURACY MEASURING APPARATUS

Wesley G. Runyan, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 128,334, Mar. 7, 1980, Pat. No. 4,321,832. This application Nov. 2, 1981, Ser. No. 317,217

Int. Cl.³ G06F 15/20

U.S. Cl. 364—558 **5 Claims**



1. The electronic system comprising:

(a) a predetermined number j of variable value resistors, wherein j is an integer ≥ 1, and each of the j resistors is variable with one or more of two physical quantities, namely, QT_1 and QT_2,

(b) a predetermined number m of fixed value resistors, m being an integer ≥ 1,

(c) means for generating (1) a first output having a signal characteristic ϕ_1 which obeys a first function of one or more of the (j+m) resistors, and (2) a second output having a signal characteristic ϕ_2 which obeys a second function of one or more of the (j+m) resistors, dependent variables ϕ_1 and ϕ_2 thus being dependent on, and thus having functional relationships with, one or more of the following arguments, namely: QT_1; QT_2; one or more of said fixed value resistors;

(d) memory means containing customized data derived from previously conducted measurements of said functional relationships,

(e) means for (1) receiving said customized data and said first and second outputs, and (2) using said customized data and ϕ_1 and ϕ_2 in a predetermined manner to provide output representative of at least one of QT_1 or QT_2,

(f) wherein, (i) all of the resistors upon which ϕ_1 and ϕ_2

depend and (ii) said memory means, are wedded together as a set, whereby, nothing in (i) or (ii) is easily replaced without the entire set of (i) and (ii) being replaced.

4,446,528

SHOPPERS CALCULATOR

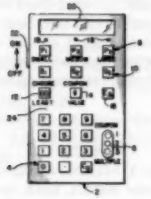
Robert A. Marmon, 339 N. Latches La., Merion Station, Pa. 19066

Division of Ser. No. 147,002, May 6, 1980, Pat. No. 4,334,278. This application Feb. 18, 1982, Ser. No. 350,044

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—709 **9 Claims**



1. An apparatus for determining the most economical purchase among products available in at least two sizes, and at different prices, comprising:

(a) a first register for storing numerical values corresponding to the product prices and the product sizes;

(b) a keyboard connected to inputs of the first register for entering data corresponding to the numerical values;

(c) an arithmetic unit connected to outputs of the first register for calculating price/size ratios corresponding to each of the stored prices and the stored sizes, the arithmetic unit providing a numerical ratio for each of the product sizes which reflects a price divided by the corresponding product size;

(d) a second register connected to outputs of the arithmetic unit for storing the numerical ratios;

(e) a value comparator connected to outputs of the second register for determining the smallest of the numerical ratios;

(f) means connected to outputs of the value comparator for selecting the smallest numerical ratio as an output; and,

(g) an indicator corresponding to each product size, one of which indicators displays the selected output of the value comparator.

4,446,529

LINEAR INTERPOLATION BETWEEN REGULARLY SPACED DIGITAL SAMPLES

Christopher H. Strolle, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 23, 1981, Ser. No. 304,924

Claims priority, application United Kingdom, Jan. 26, 1981, 8102281

Int. Cl.³ G06F *15/353*

U.S. Cl. 364—723 **13 Claims**

1. In combination:

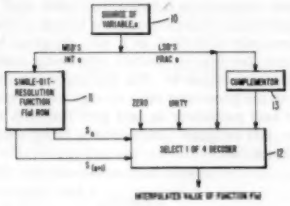
means for supplying binary numbers descriptive of a variable, each binary number having an integral portion and at least some of them, at times having fractional portions;

a memory, having storage locations addressable in terms of integral portions of said variable for storing plural-bit-binary-number digital samples of a function of said variable, and responding to the integral portion of each number descriptive of said variable to supply a pair of digital samples associated with that integral portion and with that integral portion as incremented by unity; and

means for accumulating a number of terms corresponding to the number of bits in said digital samples to generate a linear interpolation between each pair of samples, each successive term being shifted in all its places in the direction of increased significance by a number of bits equal to the power of two which is described by each successive place in both of said pair of digital samples, and each successive term being generated responsive to those places in said both of said pair of digital samples, said means for accumulating including

means for selecting zero for each term for which the corresponding places in both digital samples are ZEROs,

means for selecting unity for each term for which the corresponding places in both digital samples are ONEs,



means for selecting the fractional portion of said variable for each term for which the corresponding place of the digital sample associated with the integral portion of said variable is a ZERO and the corresponding place of the digital sample associated with the integral portion of said variable as incremented by unity is a ONE,

means for generating the complements of the fractional portions of said binary numbers, and

means for selecting the complement of the fractional portion of said variable for each term for which the corresponding place of the digital sample associated with the integral portion of said variable is a ONE and the corresponding place of the digital sample associated with the integral portion of said variable as incremented by unity is a ZERO.

4,446,530

FAST HADAMARD TRANSFORM DEVICE

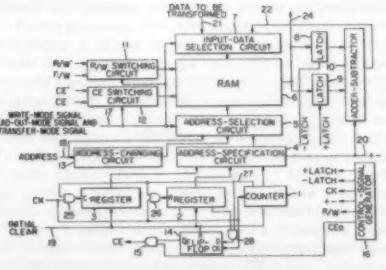
Eiichi Tsuboka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 5, 1981, Ser. No. 290,311

Claims priority, application Japan, Aug. 14, 1980, 55-111046

Int. Cl.³ G06F *15/332*

U.S. Cl. 364—725 **3 Claims**



1. In a fast Hadamard transform of order 2^m, where m = 1, 2, . . . in which $X_k(i) = X_{k-1}(i) + X_{k-1}(j)$ and

$X_k(j)=X_{k-1}(i)-X_{k-1}(j)$, where i and j=0, 1, . . . , 2^m-1 and $X_k(i)$ and $X_k(j)$ are i-th and j-th elements in the k-th transform step, a fast Hadamard transform device having an addressing means for reading intermediate transformed values into or out of a random-access memory, said device comprising:

(a) a binary counter with at least (m−1) bits;

(b) a register means for specifying the current transform step and a predetermined bit position of an address in said random access memory for the transform step; and

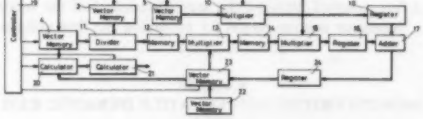
(c) an address specification means which, in the case of deriving the values of the k-th transform step from the results of the (k−1)-th transform step, holds a bit at said specified predetermined bit position of an address in said random-access memory in the logical state S (1 or 0) in the case of reading out of $X_k(i)$ but holds in the logical state $\bar{S}$, the negation of the logical state S, in the case of reading out of $X_{k-1}(j)$ or writing of $X_k(j)$ and which holds the bits at the remaining bit positions in the same pattern as that of the contents in said binary counter.

4,446,531

COMPUTER FOR CALCULATING THE SIMILARITY BETWEEN PATTERNS

Atsuo Tanaka, Nabari, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1981, Ser. No. 255,497
Claims priority, application Japan, Apr. 21, 1980, 55-53322
Int. Cl.³ G06F *15/20*; G10L *1/00*
U.S. Cl. 364—728 **4 Claims**



1. A computer for calculating the similarity between first and second patterns, the first pattern being represented by a first sequence of successive feature vectors a_i(i=1, 2, . . . I), where I=the number of feature vectors, the second pattern being represented by a second sequence of successive feature vectors b_j (j=1, 2, . . . , J), where J=the number of feature vectors, comprising:

calculating means for calculating weighting factors from feature vectors a_i and $a_{(i+1)}$ of the first pattern;

weighting means for applying the weighting factors to the feature vectors of the second pattern to calculate estimated vectors for the second pattern; and

similarity calculating means for calculating and determining the similarity between the two patterns by comparing the feature vectors of the first pattern and of the estimated vectors of the second pattern.

4,446,532

SURFACE CHARGE SIGNAL PROCESSING APPARATUS

Richard D. Baertsch, and William E. Engeler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,497
Int. Cl.³ G06G *7/19*; G11C *11/40*
U.S. Cl. 364—824 **7 Claims**

1. A waveform generator comprising:

a plurality of stages, each stage having an input terminal, a first output terminal and a second output terminal, the first output terminal of one stage being connected to the input terminal of a succeeding stage,

each stage including first and second substages, each substage including first, second, third and fourth transistors, each transistor including a source, drain and a gate,

first, second and third clocking lines,

the source-drain conduction paths of the first, second and third transistors of the first and second substages of each stage being connected in series between said first clocking line and the second output terminal of said stage,

the source-drain conduction path of said fourth transistor of each substage being connected in parallel with the source drain conduction path of said first transistor of said substage,

the gate of the fourth transistor of the first substage of a first stage of said plurality of stages being connected to the input terminal of said first stage,

an input terminal of said waveform generator being connected to said input terminal of said first stage,

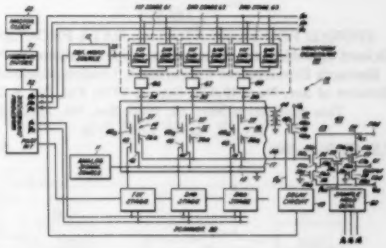
a first nodal capacitance being provided between the conductive junction of said first and second transistors of each substage and ground,

a second nodal capacitance being provided between the conductive junction of said second and third transistors of each substage and ground,

a third nodal capacitance being provided between said second output terminal of each stage and ground,

the conductive junction of the second and third transistors of the first substage of each stage being connected to the gate of the fourth transistor of the second substage of said stage,

the conductive junction of the second and third transistors of



the second substage of each stage being connected to the first output terminal of said stage,

said first clocking line being connected to the gate of the first transistor of each of said substages,

said second clocking line being connected to the gates of the second and third transistors of the first substage of each of said stages,

said third clocking line being connected to the gates of the second and third transistors of the second substage of each of said stages,

means for applying a first clocking voltage between said first clocking line and ground, said first clocking voltage having a high level during a first subperiod of each period thereof and a low level during a second subperiod of each period thereof,

means for applying a second clocking voltage between said second line and ground, said second clocking voltage having a high level during the first subperiod of a period of said first clocking voltage extending from the initiation of said high level and terminating during the second subperiod of said first period of said first clocking voltage, said second clocking voltage having a low level during the remainder of said second subperiod and during a succeeding second period of said first clocking voltage,

means for applying a third clocking voltage between said third line and ground, said third clocking voltage having a high level during the first subperiod of a succeeding second period of said first clocking voltage extending from the initiation of said high level and terminating dur-

ing the second subperiod of said second period of said first clocking voltage, said second clocking voltage having a low level during the remainder of said second subperiod of said second period and during a succeeding third period of said first clocking voltage,

whereby when a high level of signal is applied to the input terminal of a stage during a first period of the first clocking voltage, an output signal is produced at the second output terminal of said stage which has a high level during the first subperiod of the first period of said first clocking voltage, a low level during the second subperiod of said first period and a high level during the succeeding second period of said first clocking voltage and when a low level of signal is applied to the input terminal of a stage during a first period and a succeeding second period of the first clocking voltage, an output signal is produced at the second output terminal of said stage which has a high level during the first period of said first clocking voltage, a high level during the first subperiod of the succeeding second period of said first clocking voltage and a low level during the second subperiod of the succeeding second period of said first clocking voltage.

4,446,533

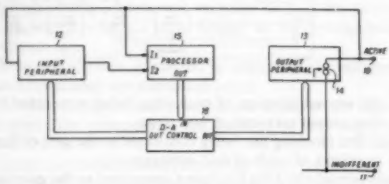
STORED PROGRAM DIGITAL DATA PROCESSOR

Richard J. Backhouse, Kalamazoo, Mich., assignor to National Research Development Corporation, London, England

Division of Ser. No. 940,327, Sep. 7, 1978, Pat. No. 4,222,385. This application May 19, 1980, Ser. No. 151,013

Int. Cl.³ G06F *7/00, 9/00*

U.S. Cl. 364—900 **5 Claims**



1. A stored program digital data processor comprising a store having independently addressable locations in two store portions defined by corresponding first and second random access memories, an address and data highway for simultaneously addressing locations independently in the store portions, an adder adapted to add the contents of two addressed locations in the two store portions respectively, a register arranged to receive the sum provided by the adder and interrupt signals, connections for writing the contents of two portions of the register in addressed locations in the two store portions respectively, a program counter arranged to count machine cycles and to address a read-only memory providing addresses and data on the highway and selectively providing control signals including a latch enable signal and a jump enable signal, and a latch arranged to store an output word from the highway in the presence of the latch enable signal and to supply said output word to output connections of the processor, and means responsive, in the presence of the jump enable signal, to one bit in the register for causing, when the said bit has a predetermined value, presetting of the program counter to a jump address determined by the address on the highway.

4,446,534

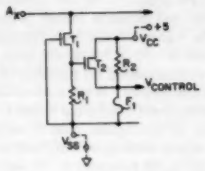
PROGRAMMABLE FUSE CIRCUIT

Frederick J. Smith, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 8, 1980, Ser. No. 214,400

Int. Cl.³ G11C *8/00*

U.S. Cl. 365—96 **6 Claims**



1. A programmable fuse circuit for providing a control signal on a control terminal comprising:

means for providing a first voltage;

means for providing a second voltage;

means for providing an input signal;

a first transistor having a first terminal coupled to the means for providing an input signal, a gate coupled to the means for providing the first voltage, and a second terminal;

a first resistor coupled between the second terminal of the first transistor and the means for providing the first voltage;

a second transistor having a first terminal coupled to the means for supplying the second voltage, a second terminal coupled to the control terminal, and a gate coupled to the second terminal of the first transistor; and

a fuse coupled between the second terminal of the second transistor and the means for providing the first voltage.

4,446,535

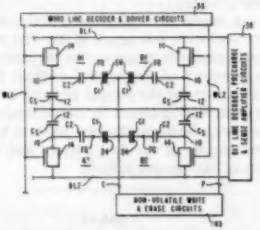
NON-INVERTING NON-VOLATILE DYNAMIC RAM CELL

Donald P. Gaffney, Williston; Gary D. Grise, Colchester, and Chung H. Lam, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,247

Int. Cl.³ G11C *11/24, 11/34*

U.S. Cl. 365—149 **12 Claims**


WORD LINE DECODER & DRIVER CIRCUITS
BIT LINE DECODER, PRECHARGE & SENSE AMPLIFIER CIRCUITS
NON-VOLATILE WRITE & ERASE CIRCUITS

1. A memory cell comprising:

a semiconductor substrate having a given type conductivity,

a floating gate and a conductive plate insulated from said substrate,

a control electrode, said floating gate being interposed between said control electrode and said substrate,

means for applying reference voltages to said plate and control electrode to produce first and second contiguous regions in said substrate of opposite conductivity type to that of said given type conductivity, said plate and said

first region forming a storage capacitor and said floating gate and said second region forming a first capacitor,

a voltage divider circuit having serially-connected said first capacitor and a second capacitor including said floating gate connected to the common point between said first and second capacitors, said voltage divider circuit being disposed between said control electrode and said second opposite conductivity type region, said second capacitor being disposed between said floating gate and said control electrode, and said second capacitor including a first enhanced conduction insulator,

an input/output line, and

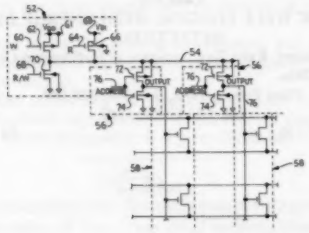
a transfer device disposed between said second opposite conductivity type region and said input/output line.

4,446,536

COMPLEMENTARY METAL OXIDE SEMICONDUCTORS ADDRESS DRIVE CIRCUIT

Richard W. Rodgers, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 21, 1982, Ser. No. 390,630
Int. Cl.³ G11C *8/00*
U.S. Cl. 365—230 **12 Claims**



1. An address drive circuit for biasing a row of storage transistors in an electrically programmable memory during memory read and write operations, and during unselected quiescent conditions comprising:

a plurality of drivers, each including first and second transistors having a gate, a source, a drain and substrate, each said driver including an addressing terminal commonly connected to the gates of said first and second transistors for receiving an addressing signal, the drain of said second transistor and the source of said first transistor commonly connected to the gates of a plurality of said storage transistors, and the drain and substrate of said first transistor connected to a ground voltage;

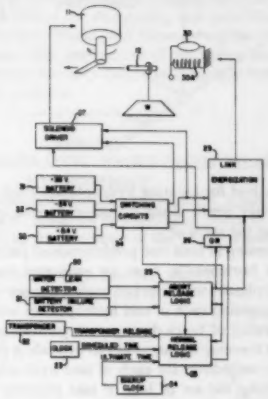
control means for providing an output voltage to said drivers, said control means having third, fourth and fifth transistors, each of said transistors having a gate, a source, a drain, and a substrate, said control means having an input control line connected to the gates of each said transistors to receive a first, second and third control signals respectively concurrently applied thereto, having the source and substrate of said fourth transistor coupled to a first supply voltage, having the source of said fifth transistor coupled to a second supply voltage, and having the drain and substrate of said third transistor and the substrate of said fifth transistor coupled to the ground potential; and means for interconnecting the source and substrate of said second transistor of each said drivers with the source and substrate of said third transistor and the drains of said fourth and fifth transistors.

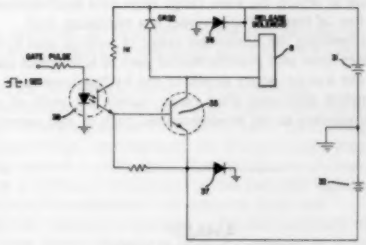
4,446,537

ELECTRONIC SYSTEM FOR RELEASE OF ON-BOTTOM SEISMOMETER UNIT

Edgar A. Bowden, Arlington; Gordon R. Deline, Carrollton, and Gerard D. Koeijmans, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 163,592, Jun. 27, 1980, abandoned.
This application Jan. 17, 1983, Ser. No. 458,422
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—15 **11 Claims**





1. A system for releasing an underwater unit comprising:

a release mechanism for releasing a ballast weight from said unit;

a plurality of release condition sensors, each producing a release output upon the occurrence of a condition in which said unit is to be recovered;

logic circuitry responsive to said release condition sensors for producing a release signal;

driving circuitry responsive to said release signal for actuating said release mechanism;

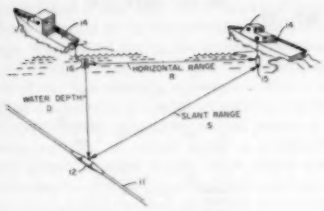
two independent power sources connected to said logic circuitry and said driving circuitry both of said power sources providing power to said driving circuitry when both of said power sources are operable; and

switching means for automatically disconnecting said logic circuitry and said driving circuitry from an inoperable one of said power sources.

4,446,538
MARINE CABLE LOCATION SYSTEM

Robert G. Zachariadis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,756
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—19 **4 Claims**



1. A method for locating hydrophones fixed in position at a known water depth along a seismic marine exploration line, comprising the steps of:

(a) traversing at least one predetermined path parallel to and offset horizontally from an estimated location for said hydrophones with a vessel having a sonar ranging unit for interrogating each of said hydrophones with a sonar pulse a plurality of times during each parallel and horizontally offset traverse of the vessel to provide a plurality of slant range recordings for each of said hydrophones;

(b) plotting the set of loci of said plurality of slant range recordings for each of said hydrophones,

(c) identifying the interesection point of said set of loci for each of said hydrophones as the location of said hydrophone at which the slant range from said hydrophone to the line of travel of said vessel is a minimum, and

(d) determining the horizontal range of each of said hydrophones from said predetermined path of said vessel utilizing the known water depth of the hydrophones and the identified minimum slant range values for each of said hydrophones to the predetermined path of said vessel.

4,446,539
SONIC LOGGING TOOL

Robert J. von Bose, Arlington, Tex., assignor to Bell Petroleum Services, Inc., Midland, Tex.

Division of Ser. No. 165,553, Jul. 3, 1980, Pat. No. 4,365,321.
This application Sep. 13, 1982, Ser. No. 417,183
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—25 **14 Claims**

1. A logging tool comprising:

pressure wave generating means for generating and transmitting pressure waves;

receiver means for receiving a portion of the transmitted pressure waves;

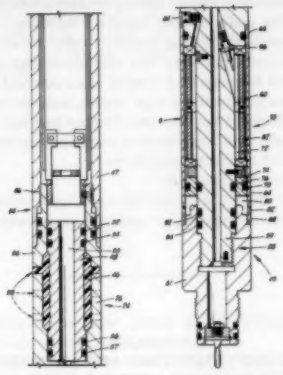
connecting means for mechanically connecting said pressure wave generating means with said receiver means, said connecting means including a core element;

damping means for damping the transmitted pressure waves attempting to pass from said pressure wave generating means to said receiver means through said connecting means;

said pressure wave generating means including:

an electrical current conductive coil; and

an electromagnetically responsive member, disposed in spaced relation with said core element and within said coil, for producing at least one of the pressure waves when an appropriate actuating current flows through said coil; and

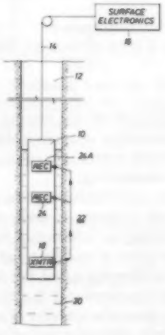


said connecting means further including structural means for providing a current conducting path around said electromagnetically responsive member.

4,446,540
ACOUSTIC WELL LOGGING WITH ENERGY LEVEL DETECTION

Mark D. Zimmer, Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 2, 1981, Ser. No. 230,189
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—26 **10 Claims**



1. The method of processing a received acoustic well logging signal in a logging system having an acoustic transmitter and at least one acoustic receiver including the steps;

(a) amplifying the received signal by a constant amount, said constant amount selected sufficient to clip same at the largest expected signal amplitudes,

(b) converting the RMS value of the amplified signal to a DC level signal representative of the average noise level in the received signal;

(c) storing said average noise level signal for a given time period immediately after transmitter firing and before first expected arrival of the acoustic wave signal;

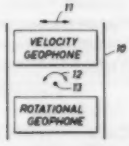
(d) comparing said stored DC average noise level signal with a DC level signal representative of the instant undelayed amplified received signal to provide a comparator output DC signal when said instant undelayed DC level signal has a predetermined increase in magnitude; and

(e) generating an output pulse of given amplitude and time duration when said comparator output DC signal has the predetermined increase in magnitude.

4,446,541
ROTATIONAL GEOPHONE

Christopher S. Cowles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1981, Ser. No. 324,229
Int. Cl.³ G01V *1/18*
U.S. Cl. 367—75 **3 Claims**



1. A method for obtaining seismic records representing shear waves preferentially detected in a given direction of propagation comprising:

measuring the instantaneous particle velocity in a direction perpendicular to the plane of rotation of the shear seismic wave;

measuring the instantaneous rate of rotation of the shear seismic wave;

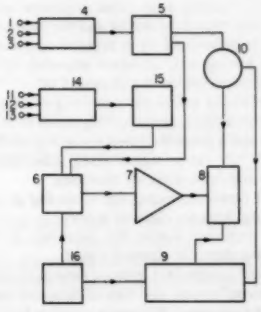
integrating the rate of rotation measurement and adjusting the amplitudes of the measured particle velocity and rate of rotation; and,

adding and subtracting the measurements after integration and amplitude adjustment to obtain records representing shear waves propagating in a given direction.

4,446,542
OCEANOGRAPHIC MEASUREMENT SYSTEM

John C. Beckerle, 38 Two Ponds Rd., Falmouth, Mass. 02540

Filed Dec. 23, 1981, Ser. No. 334,071
Int. Cl.³ G01S *15/88, 15/96*
U.S. Cl. 367—131 **3 Claims**



3. An oceanographic measurement system comprising

a plurality of sound sources located in an ocean area to be measured for emitting sound pulses,

at least two underwater sound receivers, each being responsive the reception of each of said sound pulses for generating a corresponding electrical signal,

means for establishing information indicating the location of said emitting means at the time of the reception of a sound pulse at each receiver,

means responsive to electrical signal from each of said receivers for determining the received intensity of the corresponding sound pulse,

means responsive to a set of intensity measurements for determining the peak intensity of said sound signals received at each receiver location,

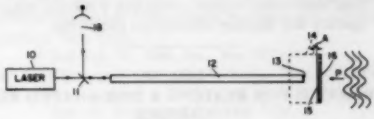
means responsive to a set of peak intensities for each receiver location taken over a fixed period of time and responsive to corresponding location information for generating a prediction of the peak intensity from said location information for each receiver location, and

means responsive to a peak intensity signals received at each receiver location corresponding to a sound signal received after said fixed period for comparing said peak intensity signals to predictions of said peak intensity and for indicating the presence and parameters of an ocean anomaly when said received intensity differs substantially from said predicted peak intensity.

4,446,543
OPTICAL RESONATOR SINGLE-MODE FIBER HYDROPHONE

Matthew N. McLandrich, Carlsbad, and Donald J. Albares, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1979, Ser. No. 54,077
Int. Cl.³ H04R *23/00*
U.S. Cl. 367—149 **4 Claims**



1. An apparatus for passively and remotely sensing the amplitude and frequency of impinging acoustic energy comprising:

means for providing a source of coherent light;

means orientated to receive coherent light from the coherent light providing means for bidirectionally transmitting the coherent light therethrough, the bidirectionally transmitting means is a single-mode fiber simultaneously transmitting a reference component of the coherent light and a reflected component of the coherent light; and

an optical resonator connected to the bidirectionally transmitting means having one portion displaceable in accordance with the impinging acoustic energy.

4,446,544
SMALL DIAMETER, LOW FREQUENCY MULTIMODE HYDROPHONE

George C. Connolly, Jr., East Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 326,303
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—155 **8 Claims**

1. A small diameter, low frequency, multimode hydrophone for receiving relatively low frequency, plane-wave acoustic signals impinging thereon, comprising:

piezoelectric means, for converting each said relatively low frequency, plane-wave acoustic signal to a plurality of quadrantal electrical signals, each of said electrical signals being proportional to said plane-wave acoustic signal as received by separate quadrants of said hydrophone, said piezoelectric means further comprising a plurality of piezoelectric cylindrical segments;

inert means, bonded to said piezoelectric means, for reducing the propagation speed of sound within said multimode

hydrophone thereby permitting said small diameter hydrophone to be formed, said inert means being bonded to said piezoelectric means, said inert means further comprising a corresponding plurality of inert cylindrical segments of identical size and shape as said piezoelectric cylindrical segments, interspersed alternately between said plurality of piezoelectric cylindrical segments, each said inert cylindrical segment being bonded to adjacent piezoelectric cylindrical segments thereby forming a generally cylindrical thin wall tube of relatively small diameter having at least two piezoelectric cylindrical segments per quadrant;

electrical conductor means, connected to said piezoelectric means within each quadrant of said hydrophone, for producing and transmitting said quadrantal electrical signals; and

signal processing means, attached to said conductor means, for receiving said quadrantal electrical signals and producing an omnidirectional signal and two spatially orthogonal directional signals containing a decade range of frequency and bearing information therefrom.

4,446,545

APPARATUS FOR READING A DISK-SHAPED RECORD CARRIER

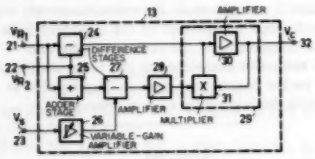
Ate Van Dijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,716

Claims priority, application Netherlands, Jan. 21, 1982, 8200208

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 369—44 **4 Claims**



1. An apparatus for reading a disk-shaped record carrier having substantially concentric information tracks, which apparatus comprises

an optical system for producing three radiation beams and projecting said radiation beams onto the record carrier as a first, second and third radiation spot, the second and third radiation spot being disposed on opposite sides of the first radiation spot in a direction transverse to the track direction and the distance between their respective centres and the axis which extends through the centre of the first radiation spot and parallel to the information tracks being at least substantially ¼ of the track pitch of the information tracks,

a first, second and third detector for detecting the amount of luminous energy in the emerging radiation beams corresponding to the first, the second and the third radiation spot respectively and for converting this luminous energy into corresponding electric output signals,

a tracking system, which co-operates with the radiation beams, for centring the first radiation spot at an information track, and

a control device, coupled to the second and the third detector, for generating a tracking-system control signal which depends on the difference between the output signals of the second and the third detector, characterized in that the control device is also coupled to the first detector and is adapted to supply a control signal V_c which complies with the formula:

$$V_c = \frac{V_{R1} - V_{R2}}{V_{R1} + V_{R2} - \alpha V_s} \cdot V_{ref}$$

where V_s, V_{R1} and V_{R2} are the output signals of the first, the second and the third detector respectively, α is an adjustment factor, and V_{ref} is a reference signal.

4,446,546

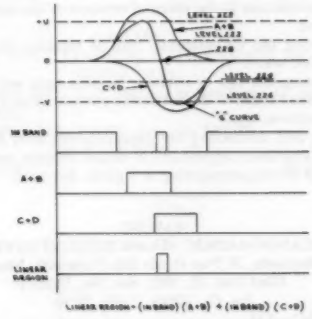
FOCUS INITIALIZATION SYSTEM FOR OPTICAL RECORDING

Christopher Miller, Colorado Springs, Colo., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 31, 1981, Ser. No. 336,245

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—45 **8 Claims**



1. A focusing initialization control system for an optical recording device having a movable objective lens disposed relatively near the recording media and the movement of said objective lens is controlled by a regular operation focusing control system having light detector elements in which said focusing initialization system is comprised of:

first signal receiving means for receiving as an input an "S" curve bipolar analog signal having peaks at near to focus conditions and a predetermined linear region between the peaks, said "S" curve signal being generated from the outputs of said light detector elements,

second signal receiving means for receiving as an input an A+B analog detector element signal,

third signal receiving means for receiving as an input a C+D analog detector element signal,

first and second comparator means connected with said first signal receiving means, said first comparator means determining that said input "S" curve signal is less than a certain predetermined value and said second comparator means determining that said "S" curve signal is greater than a predetermined value, said first and second comparator means having their outputs connected together in a wired OR circuit to produce a first logic output signal,

third comparator means connected with said second signal receiving means for producing an output logic signal indicative that said input A+B signal is within a predetermined range, said third comparator means producing a second logic output signal,

a fourth comparator means connected with said third signal receiving means for determining that said C+D input signal is within a predetermined range, said fourth comparator means a third logic output signal,

logic means for combining said first, second and third logic output signals to produce a fourth logic signal indicative that said objective lens is within the focusing region of the linear portion of said "S" curve signal, where said logic means requires said "S" curve input signal to be within predetermined limits and requires said C+D signal and said A+B signal to be within predetermined limits, and

control means responsive to said fourth logic signal from said logic means for controlling said regular focusing systems to be on when in focusing range.

4,446,547

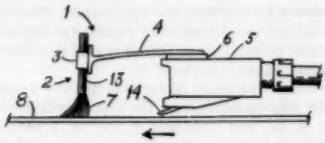
RECORD CLEANING DEVICE

Fernando Gonzalez, Burbank, Calif.

Continuation of Ser. No. 196,620, Oct. 14, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 339,843

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—74 **13 Claims**



1. Record cleaning apparatus comprising brush means for brushing undesirable material from the grooves of a phonograph record and having a predetermined flexibility when brought into contact with the record surface and suspension means for mounting said brush means to come in contact with the grooves of a phonograph record and pointed in a direction generally normal to its surface; said suspension means comprising an elongated strip of thin, lightweight and flexible material, brush attachment means for attaching said brush means to one end of said elongated strip, and strip attachment means for attaching the other end of said elongated strip to the tone arm of a record player with the strip extending lengthwise beyond the end of the tone arm in a direction in alignment with a tangent to the record grooves so that the brush is held outwardly from and beyond the arm, whereat it is supported solely by said strip, said strip and said attachment means being constructed and arranged so that the flat sides of the strip are horizontal and the width of the strip are transverse to the record grooves and tone arm, said strip having a comparable flexibility to the brush so that the deflection of the brush at the record surface and the deflection of the strip respond in comparable manner so as to exchange deflection with each other in accommodation of record warp.

4,446,548

APPARATUS FOR THE POINT-BY-POINT SCANNING OF AN OBJECT

Gijsbertus Bouwhuis, and Josephus J. M. Braat, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

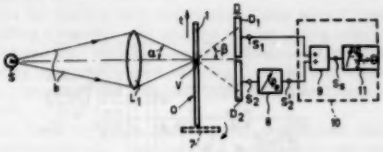
Filed Oct. 21, 1981, Ser. No. 313,418

Claims priority, application Netherlands, Jul. 24, 1981, 8103505

Int. Cl.³ G11B *11/00*

U.S. Cl. 369—109 **15 Claims**

1. An apparatus for point-by-point scanning of an object which may be a phase object, an amplitude object or a combined amplitude and phase object, said apparatus comprising means for producing a scanning beam, means for converging said beam to a spot on the object, means for detecting variations in the beam coming from the object as the object is scanned by said spot, said detecting means including at least two detectors which convert the variations in said beam into corresponding electrical signals, said detectors being disposed in the path of the beam coming from the object and being arranged after each other in the scanning direction, means for adding said electrical signals from said detectors so as to obtain



a further signal representative of the sum of said electrical signals and a variable phase shifter arranged between at least one of said detectors and said adding means for changing the phase of the electrical signal from said at least one detector so as to optimize said further signal for the type of object being scanned.

4,446,549

OPTICALLY READABLE INFORMATION DISC AND METHOD OF MANUFACTURING SAME

Gerardus J. M. Lippits; Johan G. Kloosterboer, and Godefridus Melis, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,131

Claims priority, application Netherlands, Mar. 27, 1981, 8101515

Int. Cl.³ B32B *15/08*; G11B *7/24*

U.S. Cl. 369—275 **3 Claims**

1. An optically readable information disc comprising a substrate plate on at least one surface of which there is present an information layer of a radiation cured lacquer, said information layer comprising an optically readable information track having information areas situated alternately at a higher and a lower level along the track, characterized in that, in addition to the usual auxiliary substances in a quantity by weight from 0.1 to 5%, the lacquer comprises only a single radiation curable monomeric compound in a quantity by weight from 95–99.9% and selected from the group consisting of alkendioldiacrylates, alkanedioldimethacrylates, alkeneglycoldiacrylates and alkeneglycoldimethacrylates having the acrylate or methacrylate groups in the end positions and in which the alkane radical and alkene moieties are of 4–12 carbon atoms, and in which the cured lacquer apart from the auxiliary substances comprises no or substantially no extractable material.

4,446,550

RELIABLE SIGNAL SYSTEM HAVING AT LEAST ONE TRANSMITTER FEEDING PLURAL SERIES-CONNECTED RECEIVER INPUTS

Antonio Brajder, and Christian Kublick, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 154,839, May 30, 1980. This application Jul. 23, 1982, Ser. No. 400,988

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923156

Int. Cl.³ H04B *3/00*

U.S. Cl. 370—14 **30 Claims**

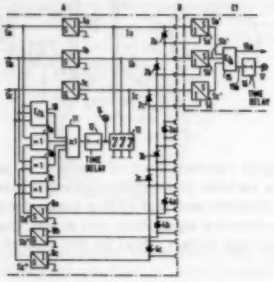
1. A signalling apparatus for reliable communication between a transmitter and a plurality of receivers at locations which are distant from that of the transmitter, the signalling apparatus comprising:

a main transmitter having an input for a signal to be transmitted and having an output;

a plurality of receivers, each located at a distance from the transmitter, each receiver having an input;

a series circuit of threshold members connected across the output of the main transmitter at the location of the transmitter, there being a threshold member for each receiver;

a plurality of transmission lines, each transmission line having an input connected across one of the threshold members and an output connected to the input of a receiver;



each threshold member including at least one Zener diode having a threshold voltage which is greater than the sum of the voltage drop across the input to the transmission line and the voltage drop across the input to the receiver when a signal is being received by the receiver; and

a control receiver having an input connected in series with the series circuit of threshold members to provide an output signal when a signal is transmitted to the receiver assembly.

4,446,551

DATA HIGHWAY SYSTEM WITH DUAL TRANSMITTING LOOP LINES

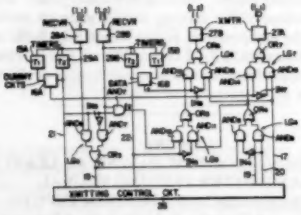
Toshiya Seo, Numazu, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,807

Claims priority, application Japan, Oct. 9, 1980, 55-141253

Int. Cl.³ H04J *3/14*; H04B *3/46*

U.S. Cl. 370—16 **3 Claims**



1. A data highway system comprising first and second unidirectional looped data transmission lines, n data stations connected by said two transmission lines so data are transmitted between the stations via said lines in opposite directions, where n is an integer greater than one,

data station K, where K is selectively every one of the n integers, including:

(a) line break or disconnect detecting means comprising first and second timers having different time periods T_1 and T_2, where T_1 is smaller than T_2, said first and second timers being connected to the lines connected to the station K to be responsive to data transmitted on the first transmission line to produce first and second outputs respectively having time intervals equal to periods T_1 and T_2, said second output indicating a break in the first transmission line,

(b) gate signal producing means connected to be responsive to said first and second outputs of said timers for deriving a dummy data gate signal,

(c) first means for selecting the data transmitted from the first transmission line in response to the output of said second timer,

(d) transmission control means for controlling transmission in response to the break indicating output derived as the output of said second timer and the output of said first means for deriving outputs including transmission data, a transmission gate signal and dummy data,

(e) second means for selecting the output of said first means and the transmission data at mutually exclusive times in response to the value of the transmission gate signal,

(f) third means for selectng the output of said second means and the dummy data at mutually exclusive times in response to value of the dummy data gate signal to transmit the signal thus selected to the first transmission line,

(g) fourth means responsive to the second output as derived from said second timer and data transmitted from the second transmission line to produce a gate signal indicating a break of the first transmission line, and

(h) fifth means for selecting the transmission data fed as the output of said second means in response to the output of said fourth means to transmit the signal thus selected to the second transmission line,

whereby when (1) there is no break in the first transmission line, the data transmitted on the first transmission line is routed to the first transmission line via a normal path including said third means, (2) a break on the first transmission line occurs, (i) the data station positioned downstream of the broken portion routes the dummy data to the first transmission line via said normal path and data transmitted from the second transmission line is routed to the first transmission line via the looped-back path including the third means, and (ii) at the data station positioned upstream of the broken portion, said data transmitted from the first transmission line are routed to the second transmission line via the looped-back path including said fifth means.

4,446,552

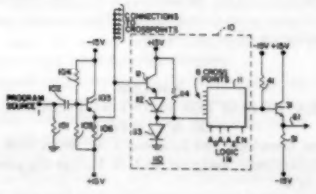
WIDEBAND SWITCH CROSSPOINT AND SWITCHING MATRIX

Ernest P. Tweedy, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 21, 1981, Ser. No. 332,983

Int. Cl.³ H04J *3/02*

U.S. Cl. 370—58 **5 Claims**



1. A wideband switch crosspoint comprising

an n-channel multiplex switching means having corresponding channel inputs thereto, an output, and controls therefor, said multiplex switching means having an attenuation between an "on" and an "off" condition in a range 30 dB to 40 dB at a frequency of 20 MHz;

an output transistor having a control electrode coupled to said output of said multiplex switching means;

a first resistor for coupling said output of said multiplex switching means to a voltage source of a first polarity;

an intermediate transistor having a collector adapted to be coupled to a voltage source of an opposite polarity, a base, and an emitter;

a first diode having a first electrode coupled to said emitter, and having a second electrode.

a second diode having a first electrode coupled to said second electrode of said first diode, and having a second electrode coupled to a point of reference potential,

said base-emitter, said first diode first electrode-second electrode, said second diode first electrode-second electrode, and said opposite polarity-reference potential being poled in a common direction;

a second resistor coupled between said collector and said first electrode of said second diode;

an initial transistor stage having an input adapted to be coupled to a program source, and having an output coupled to, and adapted to provide a small d.c. voltage at said first polarity to, said base; and

means for coupling said first electrode of said second diode to one of said channel inputs, whereby,

when said multiplex switching means is controlled "on" with respect to said one of said channel inputs, a voltage at said first polarity is applied from said output of said multiplex switching means to said first electrode of said second diode, providing for conduction through said intermediate transistor and said first diode, and providing for non-conduction through said second diode, thereby permitting a signal from said program source to pass through said initial transistor stage, said intermediate transistor, said first diode, said multiplex switching means, and said output transistor, and

when said multiplex switching means is controlled "off" with respect to said one of said channel inputs, said voltage source at said opposite polarity causes a current to flow through said second resistor and said second diode to said point of reference potential so that said first electrode of said second diode is maintained at a small voltage of said opposite polarity, turning off said first diode and causing nonconduction of said intermediate transistor, and

whereby said wideband switch crosspoint has an overall attenuation between an "on" and an "off" condition in excess of 80 dB at a frequency of 20 MHz, and

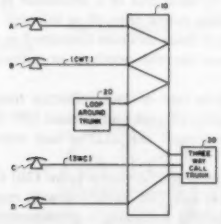
wherein n is a positive integer.

4,446,553

ARRANGEMENT FOR MULTIPLE CUSTOM CALLING

Robert C. Webber, Glendale, Ariz., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 29, 1981, Ser. No. 316,268
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—62 **4 Claims**



1. In a telephone switching office, an arrangement for multiple custom calling comprising:

a CPU;

a switching network connected to said CPU;

a plurality of telephone subscribers connected to said switching network including at least a first and a second custom calling subscriber and a third and a fourth telephone subscriber;

said first and second custom calling subscribers and said third telephone subscriber engaged in an active call waiting call with said first custom calling subscriber as the controlling party of said active call waiting call;

means for detecting a request for a three way call from said second custom calling subscriber to call said fourth subscriber, said means for detecting connected to said switching network and being operated to transmit said request to said CPU;

means for holding said connection of said second custom calling subscriber with said first custom calling subscriber and said third telephone subscriber, said means for holding being connected to said switching network and operated in response to said request to said CPU for said three way call;

means for temporarily disconnecting said second custom calling subscriber from said call waiting call, said means for temporarily disconnecting being connected to said switching network and operated in response to said request to said CPU for said three-way call;

first means for connecting a plurality of subscribers, said first means for connecting being connected to said switching network;

said second custom calling subscriber and said fourth subscriber, each connected to said first means for connecting via a separate talking path through said switching network;

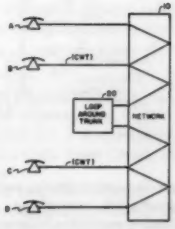
second means for connecting two telephone subscribers within the same switching office, said second means for connecting being connected to said first custom calling subscriber via said switching network and further being connected to said first means for connecting via said switching network to establish an active three way call, said second means for connecting operated in response to said CPU request for said three way call to provide for connecting said first and said second custom calling subscribers while rendering said active call waiting call and said active three way call independently controlled.

4,446,554

ARRANGEMENT FOR MULTIPLE CUSTOM CALLING

Robert C. Webber, Glendale, Ariz., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 29, 1981, Ser. No. 316,377
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—62 **6 Claims**



1. In a telephone switching office, an arrangement for multiple custom calling comprising:

a CPU;

a switching network connected to said CPU;

a plurality of telephone subscribers connected to said switching network including at least a first and second custom calling subscriber and a third and a fourth telephone subscriber;

first means for connecting said second custom calling subscriber to said third telephone subscriber via said switching network in an active telephone call;

second means for connecting said second custom calling

subscriber to said first custom calling subscriber via said switching network in an active first call waiting call;

means for detecting a request for a second call waiting call from a fourth telephone subscriber to said first custom calling subscriber, said means for detecting connected to said switching network and being operated to transmit said second call waiting call request to said CPU;

means for temporarily disconnecting said first subscriber from said first call waiting call, said means for temporarily disconnecting being connected to said switching network and operated in response to said request to said CPU for said second call waiting call;

third means for connecting said fourth telephone subscriber to said first custom calling subscriber via said switching network, said third means for connecting operated in response to said means for temporarily disconnecting to render said second call waiting call an active telephone call; and

fourth means for connecting telephone subscribers within the same switching office, said fourth means for connecting being connected to said first custom calling subscriber via said switching network and connected to said second custom calling subscriber via said switching network, said fourth means for connecting operated in response to said means for temporarily disconnecting to provide for a talking path connection of said first and said second custom calling subscribers while rendering each of said first and said second active calling waiting calls independently controlled.

4,446,555

TIME DIVISION MULTIPLEX SWITCHING NETWORK FOR MULTISERVICE DIGITAL NETWORKS

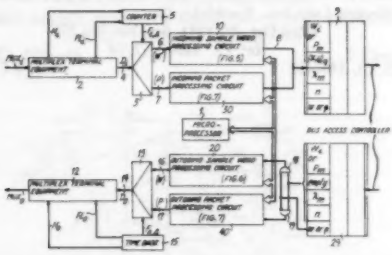
Michel Devault, 22, rue de Bourgogne, Lannion, France (22300); Jean-Paul Quinquis, Rue de Cornic, Perros Quirec, France (22700), and Yvon Rouaud, Les Fontaines A. 33, Lannion, France (22300)

Filed Feb. 22, 1982, Ser. No. 350,891

Claims priority, application France, Feb. 20, 1981, 81 03440

Int. Cl.³ H04J *3/02*

U.S. Cl. 370—94 **2 Claims**



1. Asynchronous time division multiplex switching network for multiservice digital network, comprising :

a plurality of time division multiplex bidirectional highways conveying digital data arranged in a hybrid frame including a time slot part and a packet channel part, said time slot part being formed of a plurality of time slots containing sample words having a variable number of bits and said packet channel part being formed of a plurality of channels for packets having a variable number of bits;

a plurality of data transmit and receive stations,.connected to and associated with said bidirectional highways;

a plurality of buses connecting said transmit and receive stations therebetween and selectively interconnecting an originating bidirectional highway to a terminating bidirectional highway through an originating and a terminating transmit and receive stations;

means in each transmit station for converting the sample words in the time slot part of the hybrid frame and the packets in the packet channel part of said hybrid frame of an originating highway into a message including, for the sample word in each time slot, the said sample word, its number of bits, the address of the terminating highway, the number of the time slot in the hybrid frame of said terminating highway and a first sort-of-data indicator marking sample words and, for the packet in each packet channel, the said packet, its number of bits, the address of the terminating highway, the number of the packet channel in the hybrid frame of said terminating highway and a second sort-of-data indicator marking the packets;

means for transmitting said messages from said originating highway to said terminating highway;

means in each receive station for deleting from said messages the number of bits of the sample words and packets, the address of the terminating highway, the number of the time slots and packet channels and the first and second data indicators;

means for memorizing said time slot and packet channel numbers and said first and second data indicator; and

means for inserting in the hybrid frame of the terminating highway the sample words and packets depending on said time slot and packet numbers and data indicators.

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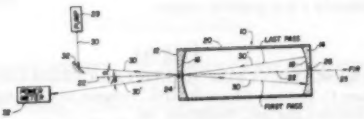
OFF-AXIS COHERENTLY PUMPED LASER

Gerhard A. Koepf, Seabrook, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 23, 1980, Ser. No. 199,766

Int. Cl.³ H01S *3/05, 3/08, 3/094*

U.S. Cl. 372—4 **14 Claims**



1. A coherent optically pumped laser system having controlled propagation of a pump beam, comprising:

cavity resonator means (**10**) including optical reflector means (**12, 14**) at each end of a resonator body (**20**) for providing multiple round trips of an injected pump beam (**30**) for exciting a laser medium contained in said resonator body (**20**) and thereby produce an output laser beam (**25**);

offset means (**24**) in one of said reflector means (**12**) for providing injection of said pump beam (**30**) at a location offset from the central axis (**22**) of said resonator body (**20**);

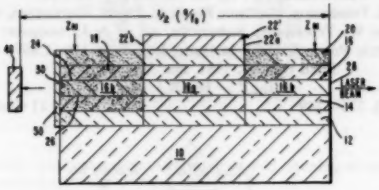
means (**32**) for injecting said pump beam (**30**) through said offset means (**24**) at a first angle (α) with respect to said central axis whereby following a predetermined number of round trips of said pump beam in said resonator body said pump beam emerges from said offset means as a beam (**30'**) skewed at a second angle (β) with respect to said injected pump beam (**30**) so that no overlap of the beam vertices occur at said offset means (**24**) and pump beam feedback is thereby eliminated; and

means (**32**) located external to said resonator means for receiving and utilizing the emergent pump beam (**30'**) for a selected purpose.

4,446,557
MODE-LOCKED SEMICONDUCTOR LASER WITH TUNABLE EXTERNAL CAVITY

Luis Figueroa, Raleigh, N.C., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 6, 1981, Ser. No. 319,014
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **17 Claims**



1. A semiconductor crystal laser having a very high pulse repetition rate, comprising:

a semiconductor hole source layer and a semiconductor electron source layer overlying said substrate;

a semiconductor optical layer sandwiched between said hole source and electron source layers, said optical layer having a principal noise resonance frequency f_0, said optical layer being defined by a near facet and a far facet facing one another;

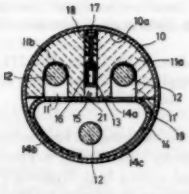
electrode means for applying an electric field across said optical layer; and

an external mirror facing said near facet and defining a laser cavity between said mirror and said far facet, said mirror being located such that the length L of said laser cavity is equal to $C/2mf_0$, where C is approximately the speed of light and m is an integer; an electrode of said electrode means partially overlying said electron source, hole source and optical layers so as to cover a partial region of said optical layer; and dopant substrate absorbing centers deposited in a remaining region of said optical layer, said remaining region of said optical layer being registered with said electrode.

4,446,558
CO_2 LASER WAVE GUIDE

Gunther Sepp, Ottobrunn, and Peter Dyrna, Haar, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,706
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043574
Int. Cl.³ H01S *3/02*
U.S. Cl. 372—64 **12 Claims**

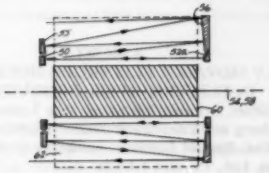


1. In a CO_2 laser a wave guide, comprising a longitudinal metal housing (**10**) having a housing wall with an inner surface (**10*a***), first and second electrodes operatively supported (**13, 14; 114**) inside said housing opposite each other for defining a wave guide duct between said first and second electrodes, a boron nitride body (**11*a*, 11*b*; 111*a*, 111*b***) located inside said housing (**10**), said body having a gap (**15**) therein for holding said first electrode (**13**) inside said gap (**15**), said second electrode having a shape forming three portions, one electrode portion resting against said boron nitride body and two electrode portions resting against said inner housing surface for holding said boron nitride body also against said inner surface of said housing wall, whereby the boron nitride body and said second electrode mutually support each other in said housing and said first electrode (**13**) is substantially supported in said gap (**15**) of the boron nitride body, and capillary duct means (**21**) operatively arranged in said waveguide duct.

4,446,559
LASER WITH ANNULAR RESONATOR

Karlheinz von Bieren, Camarillo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1981, Ser. No. 332,564
Int. Cl.³ H10S *3/00*
U.S. Cl. 372—95 **16 Claims**



1. A laser system comprising:

means for establishing an annular gain medium region disposed about an optical axis, the gain medium region having first and second opposite annular ends;

a first reflector centered on the optical axis closely adjacent to the first end of the gain medium region;

a second reflector centered on the optical axis closely adjacent to the second end of the gain medium region, the first and second reflectors shaped to magnify electromagnetic waves impinging thereon beyond the periphery of one of the reflectors; and

diffracting means for diffracting back on itself a portion of the energy which is directed upon the diffracting means from an interior region of one of said reflectors, said portion of diffracted energy being sufficiently large to sustain electromagnetic oscillations in the gain medium.

4,446,560
HIGH POWER ELECTRIC GENERATOR, ESPECIALLY ADAPTED FOR POWERING PROCESSES INVOLVING DISCHARGE IN A RARIFIED ATMOSPHERE

Gabriel Gabor, La Celle Saint Cloud, France, assignor to Jean Frager, France

Filed Dec. 16, 1981, Ser. No. 331,207
Claims priority, application France, Dec. 19, 1980, 80 27017
Int. Cl.³ H05H *1/24*; H02P *13/22*
U.S. Cl. 373—25 **6 Claims**

1. A high power electric generator for high powered ion discharge into a rarified atmosphere, said generator comprising:

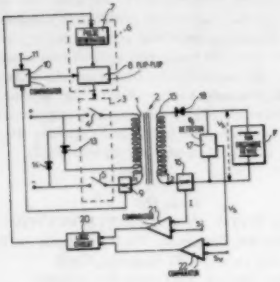
(a) pulse generator means for generating a rectified current having a constant frequency and a variable pulse width,

(b) an inductance means having a primary circuit for receiving said variable pulse width current and a secondary circuit connected across an ion discharge device used for treating materials in a rarified gaseous atmosphere,

(c) a first control circuit for varying the pulse width of the rectified current by superseding the pulse generator,

(d) arc protection means for preventing the formation of an

arc in said discharge device, said means including a secondary voltage detector, a secondary current detector and

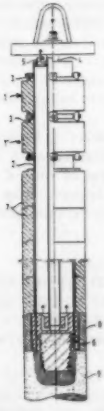


means for terminating said rectified current in response to an over threshold current-under threshold voltage condition.

4,446,561
AXIALLY MOVABLE ELECTRODE HOLDER FOR USE IN ELECTRIC STEEL PRODUCTION

Dieter Zöllner, Schwaig/Nürnberg; Inge Lauterbach-Dammler, Nuremberg, and Friedrich Rittmann, Rückersdorf/Nürnberg, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems, Ltd., Cayman Islands

Filed Aug. 26, 1982, Ser. No. 411,896
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135960
Int. Cl.³ H05B *7/101*
U.S. Cl. 373—93 **19 Claims**

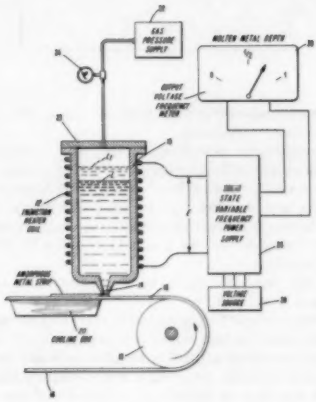


1. In an axially movable metallic electrode holder having a threadable interconnection means for attaching active electrode parts of consumable material to the electrode holder, and a cooling means having a supply and a return coolant conduit pipe, and at least one contact means by which the electrode holder is mechanically engaged by clamping jaws and thereby electrically connected to a supply of electrical current, the improvement comprising the contact arrangement having at least an uppermost and a lowermost contact zone of a pressure-resistant material, each contact zone having an axial dimension sufficient to receive the clamping jaws, whereby a distance between the uppermost and the lowermost contact zone corresponds to at least a portion of an allowable length of consumption of the active electrode parts.

4,446,562
METHOD AND APPARATUS FOR MEASURING CRUCIBLE LEVEL OF MOLTEN METAL

Paul G. Friedmann, Madison; Frank N. Patris, Flemington, and Allan W. Tomalesky, Somerville, all of N.J., assignors to Electric Power Rsearch Institute, Inc., Palo Alto, Calif.

Filed Oct. 13, 1981, Ser. No. 311,025
Int. Cl.³ H05B *5/04*
U.S. Cl. 373—149 **11 Claims**



4. Apparatus for detection of the volume of molten level within a crucible comprising:

(a) induction coil heating means surrounding said crucible for heating said metal;

(b) power supply means for said induction coil, including:

(i) compensating means for compensating for power dissipation variations in said induction coil caused by variations in the volume of said molten metal;

(ii) frequency varying means for varying the frequency of power supplied to said induction coil thereby to compensate for said power dissipation variations; and

(c) frequency detecting means for detecting the frequency of said power supplied to said induction coil.

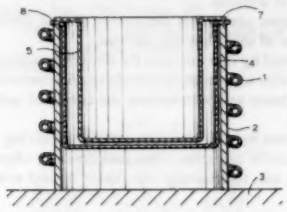
4,446,563
COMPOSITE CRUCIBLE

Gerard Willay, Ars sur Moselle, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-En-Laye, France

Filed Jun. 8, 1981, Ser. No. 271,179
Claims priority, application France, Jun. 12, 1980, 80 13111
Int. Cl.³ F27B *14/10*
U.S. Cl. 373—157 **5 Claims**

1. A composite crucible designed for the fusion of non metallic analytical samples by induction to be placed in an induction heating coil supplied with a high frequency electric current, comprising, two separate containers arranged in one another which can be separated, an outer container being made of a noble metal and a detachable inner container being made of a carbon material, said inner container having an upper end and said outer container having an opening with an edge; and means provided to form a closed space between the two con-

tainers, said conforming means comprising a flange disposed at said upper end of said inner container so that said inner container can bear against said edge of said opening of said outer container.

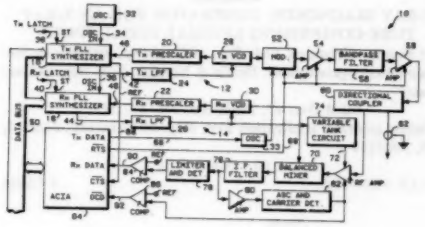


4,446,564

PHASE LOCKED LOOP FREQUENCY SYNTHESIZER CIRCUIT AND METHOD FOR INTERCOMPUTER COMMUNICATION ON A LOCAL NETWORK OF BROADBAND RF MODEMS

William D. Pierce, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 7, 1981, Ser. No. 328,276
Int. Cl.³ H04J 1/14
U.S. Cl. 375—8 **3 Claims**



1. A method for the intertransmission of data between a plurality of modems each having its own unique receive frequency comprising the steps of:

monitoring at a first one of said modems for a first signal at said unique receive frequency of a second one of said modems,

transmitting said data including said unique receive frequency of said first modem on a carrier at said unique receive frequency of said second modem when no first signal is detected,

awaiting reception at said first modem for a second signal at the unique receive frequency of said first modem, and

retransmitting said data when said second signal is not received at said first modem.

4,446,565

CVSD TRANSMISSION WITH IMPROVED INTELLIGIBILITY OF VOICE SIGNALS

Charles A. Backof, Jr., Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

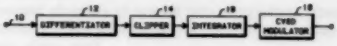
Filed Dec. 30, 1980, Ser. No. 221,187
Int. Cl.³ H03K 13/22
U.S. Cl. 375—32 **9 Claims**

1. A method of improving intelligibility in a system having as an input an electrical analog of a voice signal that is limited to a passband and that is subjected to CVSD modulation, the method matching characteristics of different speakers more closely to characteristics of CVSD modulation, the method comprising the steps of:

a. differentiating the electrical analog by applying same to a high pass filter having a crossover above the passband to produce a differentiated signal;

b. clipping the differentiated signal to produce a substantially symmetrical clipped differentiated signal;

c. integrating the clipped differentiated signal by applying



same to a low pass filter having a crossover below the passband to produce a preprocessed signal whose frequency components outside the passband are substantially attenuated relative the frequency components within the passband; and

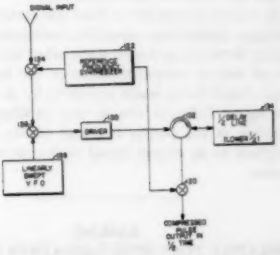
d. applying the preprocessed signal to a CVSD modulator, of the type which produces a digitally encoded bit stream representative of an analog input, whereby said digitally encoded bit stream provides improved intelligibility.

4,446,566

DISPERSIVE DELAY LINES

Harrison W. Fuller, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 39,230, May 14, 1979, Pat. No. 4,310,816.
This application May 11, 1981, Ser. No. 262,081
Int. Cl.³ H03H 7/30
U.S. Cl. 375—96 **3 Claims**



1. A high dynamic range compressive delay line system comprising:

means for generating a frequency swept signal suitable for compression by a dispersive delay line;

a dispersive delay line terminated at one end and having a single combined input/output port at the other end thereof;

a non-dispersive delay line section having an input end, and an output end connected to said dispersive delay line at said single combined input/output port end;

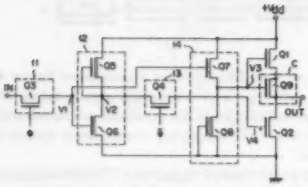
means for interrupting the input to said non-dispersive delay line; and

means for applying said frequency swept signal to the input end of said non-dispersive delay line section in timed relation to the sweep of said frequency swept signal such that the application of said frequency swept signal is interrupted by said interrupted means before compressive pulse output signals from said non-dispersive delay line appear at the input end of said non-dispersive delay line section, whereby isolation is established between input and output signals to and from said dispersive delay line.

4,446,567
DYNAMIC SHIFT REGISTER CIRCUIT

Tetsuya Iida, and Tatsuo Sakaue, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 237,959
Claims priority, application Japan, Mar. 5, 1980, 55-27647
Int. Cl.³ G11C *19/28;* H03K *23/22*
U.S. Cl. 377—79 **4 Claims**

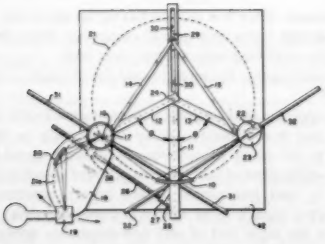


1. A dynamic shift register circuit comprising:
an input terminal;
an output terminal;
first transfer gate means connected to the input terminal for receiving an input signal and transferring the input signal under the control of a first clock signal;
inverter means for inverting the level of an output signal of the first transfer gate means;
second transfer gate means connected to the inverter means for receiving an output signal of the inverter means and transferring the output signal of the inverter means under the control of a second clock signal which has a level opposite to that of the first clock signal;
a signal follower circuit for producing an output signal having a level which follows the level of the output signal of the first transfer gate means; and
a logic circuit connected to first and second power source voltages, comprising capacitive bootstrapping means connected between an output terminal of said signal follower circuit and an output terminal of the logic circuit, said logic circuit being made operative by an output signal of the signal follower circuit and producing an inverter function at the output terminal of the logic circuit, in response to an output signal of the second transfer gate means.

4,446,568
VERSATILE FOCUSING RADIATION ANALYZER

Arthur R. Williams, and William L. Johnson, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 5, 1981, Ser. No. 270,968
Int. Cl.³ G01N *23/02, 23/20, 23/22*
U.S. Cl. 378—3 **12 Claims**

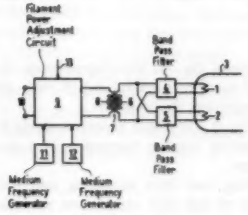


1. A focusing radiation analyzer comprising
a concave element shaped so that its concave reflecting surface lies on the circumference of a circle,
means for supporting said concave element on said circumference of a circle,
two side arms pivoted at the center of said circle, one on each side of said concave element,
means carried by one side arm for directing radiation from a virtual point source on said circle to said concave element, with its beam axis intersecting the center of said concave element,
means carried by the other side arm for receiving at a point on said circle radiation from said concave element, with its beam axis intersecting the center of said concave element,
means for maintaining arcs on said circle between the center of said concave element and each side arm equal as the arc of one side arm is varied, and
means for simultaneously maintaining the beam axis of said radiation means and the beam axis of said receiving means intersecting the center of said concave element as said arc of one side arm is varied, wherein said concave element is a diffraction sample bent for focusing radiation from said virtual point source on said circle to said receiving point of the receiving means on said circle.

4,446,569
X-RAY DIAGNOSTIC GENERATOR FOR AN X-RAY TUBE COMPRISING SEVERAL FOCAL SPOTS

Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,215
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001118
Int. Cl.³ H05G *1/30*
U.S. Cl. 378—115 **1 Claim**



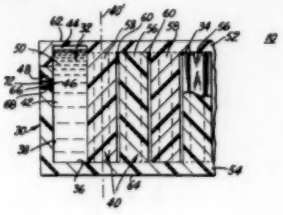
1. An x-ray diagnostic generator comprising:
an x-ray tube comprising a plurality of focal spots and a respective heating element for each of said focal spots;
a supply device comprising a single filament supply transformer including a primary winding and a secondary winding, a plurality of filament supply generators operable one at a time and each operable to generate a respective specific frequency and each assigned to a respective heating element, and a filament power adjustment circuit connected between said plurality of generators and said primary winding; and
a plurality of band pass filters, each of said band pass filters having a pass band for passing only the specific frequency of a respective generator and each connected across said secondary winding and across the heating filament assigned to the respective generator, for selective energization of said heating filaments.

4,446,570

COLLIMATOR FOR A RADIATION DETECTOR AND METHOD OF MAKING SAME

William R. Guth, Hoffman Estates, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jul. 17, 1981, Ser. No. 284,226
Int. Cl.³ G03B 41/16
U.S. Cl. 378—149 9 Claims



1. A collimator having a plurality of septa and a plurality of apertures for channeling rays between a source of radiation and a transducer of a radiation detector after having positioned the collimator between the source of radiation and the radiation detector, comprising;

(a) a collimator housing comprising

(a1) a base member of radiation transmitting material having a lower and a side surface; and

(a2) a cover plate of radiation transmitting material having an upper and a side surface;

(b) a first plurality of spaced pins of radiation transmitting material formed integrally with the lower surface of the base member;

(c) a second plurality of spaced pins of radiation transmitting material formed integrally with the upper surface of the cover plate; and

(d) a normally fluid radiation opaque material;

wherein the base member and the cover plates are mated together such that the first plurality of pins of the base member is in sealing contact with the upper surface of the cover plate and the second plurality of pins of the cover plate is in sealing contact with the lower surface of the base member, thus forming a collimator housing having an internal cavity bounded by upper, lower and side internal surfaces; and having a plurality of spaced pins of radiation transmitting material located within the cavity, formed integrally with the housing and joining the upper and lower surfaces to form the collimator apertures; and wherein the normally fluid radiation opaque material fills the spaces of the cavity between adjacent pins and between the pins and the side surface to form the collimator septa.

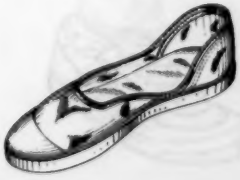
273,624
WADE FISHING BOOT
Delos L. Finch, 519 Carolina, San Antonio, Tex. 78210
Filed Oct. 19, 1981, Ser. No. 312,793
Term of patent 14 years
U.S. Cl. D2—275

273,625
KNITTED SLIPPER
Anthony J. Marterie, 194 Knollwood Dr., San Rafael, Calif. 94901
Filed Oct. 5, 1981, Ser. No. 308,474
Term of patent 14 years
U.S. Cl. D2—279

273,626
KNITTED SLIPPER
Anthony J. Marterie, 194 Knollwood Dr., San Rafael, Calif. 94901
Filed Oct. 5, 1981, Ser. No. 308,475
Term of patent 14 years
U.S. Cl. D2—279

273,627
SNEAKER
Stephen Huberman, and Daniel Lasky, both of 500 Collins St., Melbourne 3000, Australia
Filed Nov. 24, 1981, Ser. No. 324,616
Term of patent 14 years
U.S. Cl. D2—282

273,628
SNEAKER
Stephen Huberman, and Daniel Lasky, both of 500 Collins St., Melbourne 3000, Australia
Filed Nov. 24, 1981, Ser. No. 324,617
Term of patent 14 years
U.S. Cl. D2—282



273,629
SLIPPER
Dieter H. G. Horn, 142 Coolgardie Ave., Redcliffe, Australia
Filed Sep. 15, 1981, Ser. No. 302,659
Claims priority, application Australia, Mar. 16, 1981, 83598
Term of patent 14 years
U.S. Cl. D2—282

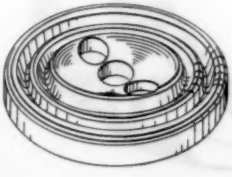
273,630
SHOE
Pierre Bidegain, Pau, France, assignor to Bidegain S.A., France
Filed Sep. 3, 1981, Ser. No. 299,864
Claims priority, application France, Mar. 4, 1981, 810785
Term of patent 14 years
U.S. Cl. D2—309

273,631
SPORT SHOE
Noboru Ueda, Chikushino, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 10, 1982, Ser. No. 386,984
Claims priority, application Japan, Dec. 14, 1981, 56-55487
Term of patent 14 years
U.S. Cl. D2—310

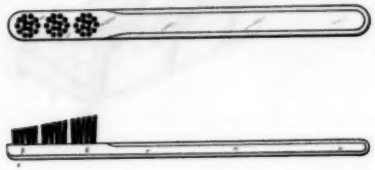
273,632
SPORT SHOE
Noboru Ueda, Chikushino, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 10, 1982, Ser. No. 387,032
Claims priority, application Japan, Dec. 14, 1981, 56-55488
Term of patent 14 years
U.S. Cl. D2—310

273,633
CUFF PORTION OF A KNITTED SOCK
Forrest E. Drum, Newton, N.C., assignor to Catawba Sox, Inc., Newton, N.C.
Filed Sep. 24, 1981, Ser. No. 305,185
Term of patent 14 years
U.S. Cl. D2—334

273,634
BUTTON
Rolf Hoffmann, Moenchengladbach, Fed. Rep. of Germany, assignor to Princeton Sportwear Corporation, Hopelawn, N.J.
Filed May 28, 1981, Ser. No. 267,772
Term of patent 14 years
U.S. Cl. D2—449



273,635
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,867
Term of patent 14 years
U.S. Cl. D4—25



273,636
DOUBLE HOLE BRUSH HANDLE
Alan C. Chu, P.O. Box 640235, Miami, Fla. 33164
Filed Feb. 4, 1982, Ser. No. 345,928
Term of patent 14 years
U.S. Cl. D4—38

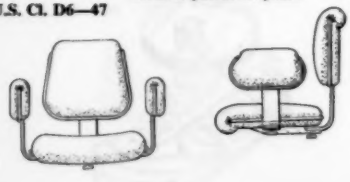
273,637
ACOUSTIC TELEPHONE ENCLOSURE AND CANOPY THEREFOR
Robert L. Benedetti, Clark, and Lajos Novak, Rivervale, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.
Filed Jan. 11, 1982, Ser. No. 338,720
Term of patent 14 years
U.S. Cl. D6—25

273,638
TABLE
Bruce Keiser, Philadelphia, Pa., assignor to Keiser Sterling Corporation, Phildelphia, Pa.
Filed Feb. 8, 1982, Ser. No. 346,820
Term of patent 14 years
U.S. Cl. D6—27

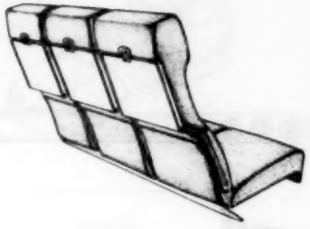
273,639
CHAIR
Vincent Cafiero, Irvington, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,779
Term of patent 14 years
U.S. Cl. D6—30

273,640
CLOSED ARM CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 10, 1981, Ser. No. 320,039
Term of patent 14 years
U.S. Cl. D6—31

273,641
SEATING UNIT
William I. Stephens, Emmaus, Pa., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 38,124, May 11, 1979. This application Nov. 30, 1981, Ser. No. 325,998
Term of patent 14 years
U.S. Cl. D6—47

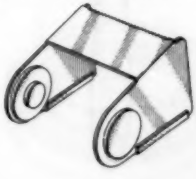


273,642
AIRCRAFT SEAT
Ralph G. Marrujo, Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.
Filed Jul. 9, 1981, Ser. No. 281,823
Term of patent 14 years
U.S. Cl. D6—48

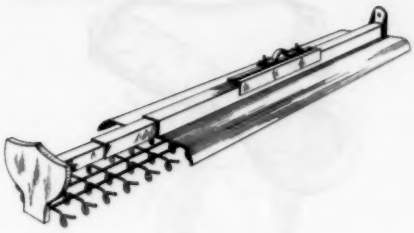


273,643
SLIDABLE BEDCLOTHES RACK FOR INSERTION BETWEEN A MATTRESS AND BOX SPRINGS
Edward F. Sanker, and Mary B. Sanker, both of 319 Beech Ave., Wyoming, Ohio 45215
Filed Jul. 13, 1981, Ser. No. 282,383
Term of patent 14 years
U.S. Cl. D6—84

273,644
FOIL DISPENSER
Ann M. Colavito, and Alphonse Galizia, both of 11 La Fond La., Orinda, Calif. 94563
Filed Jul. 30, 1981, Ser. No. 288,670
Term of patent 14 years
U.S. Cl. D6—96

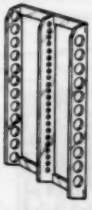


273,645
TIE RACK
Wilber C. McEvers, 655 Avenue C., SW., Winter Haven, Fla. 33880
Filed Sep. 18, 1981, Ser. No. 303,540
Term of patent 14 years
U.S. Cl. D6—117

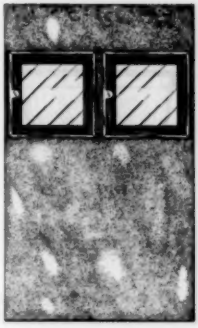


273,646
MODULAR TELEPHONE ENCLOSURE AND PRIVACY WING THEREFOR
Charles T. Avant, Somerset; Robert L. Benedetti, Clark; Donald M. Genaro, Haworth, all of N.J., and John N. McGarvey, Drexelhill, Pa., assignors to Western Electric Company, Inc., New York, N.Y.
Filed Sep. 21, 1981, Ser. No. 304,516
Term of patent 14 years
U.S. Cl. D6—181

273,647
WINE RACK
Richard Kandarian, 170 Cedarwald Ct., Rochester, Mich. 48063
Filed Aug. 24, 1981, Ser. No. 295,920
Term of patent 14 years
U.S. Cl. D6—188

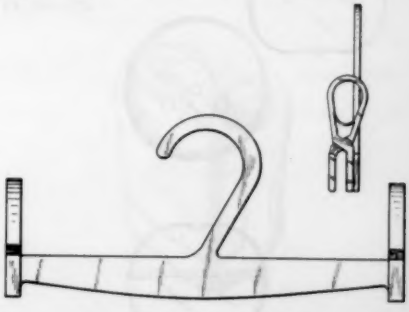


273,648
FRONT PANEL FACE FOR A WINDOWED EXHIBIT CASE
Gea Aulenti, Piazza San Marco, Milan, Italy
Filed Feb. 4, 1981, Ser. No. 231,507
Claims priority, application Italy, Aug. 18, 1980, 35963 B/80[U]
Term of patent 14 years
U.S. Cl. D6—192

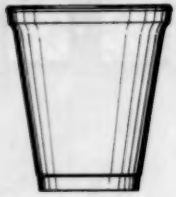


273,649
ATTACHMENT RAIL FOR THE FRONT EDGE OF A DISPLAY SHELF
William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Aug. 27, 1981, Ser. No. 296,996
Term of patent 14 years
U.S. Cl. D6—192

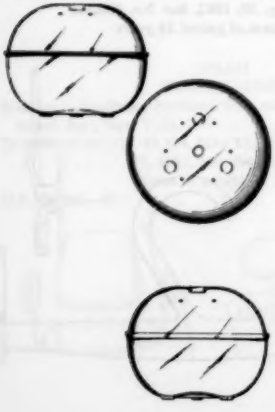
273,650
HANGER FOR SKIRTS, SLACKS OR TROUSERS
Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205
Filed Sep. 30, 1982, Ser. No. 430,265
Term of patent 14 years
U.S. Cl. D6—252



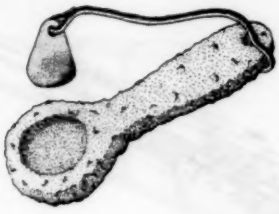
273,651
BEVERAGE CUP
Tobin L. Emrick, Mason, Mich., assignor to Dart Container Corporation, Mason, Mich.
Filed Jul. 16, 1981, Ser. No. 284,015
Term of patent 14 years
U.S. Cl. D7—6



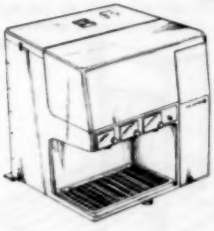
273,652
FRUIT RIPENER
Susan F. Lederman, and David M. Lederman, both of 1130 N. Bundy Dr., Los Angeles, Calif. 90049
Filed Apr. 19, 1982, Ser. No. 369,432
Term of patent 14 years
U.S. Cl. D7—17



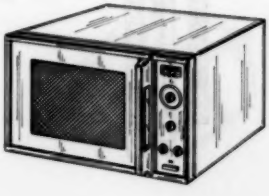
273,653
HERB GRINDER
Edwin A. Price, 1600 E. 11th Ave., Aurora, Colo. 80011
Filed Oct. 26, 1981, Ser. No. 314,998
Term of patent 14 years
U.S. Cl. D7—47



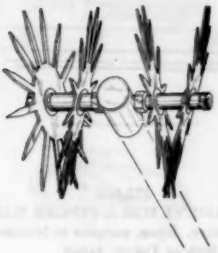
273,654
BEVERAGE DISPENSER
Jason K. Sedam, Dunwood; Richard J. Mueller, Atlanta; Andrew J. Holoubek, Stone Mountain, and Samuel C. Crosby, Decatur, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Nov. 12, 1981, Ser. No. 320,477
Term of patent 14 years
U.S. Cl. D7—307



273,655
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 29, 1982, Ser. No. 343,989
Claims priority, application Japan, Jul. 30, 1981, 56-33817
Term of patent 14 years
U.S. Cl. D7—351

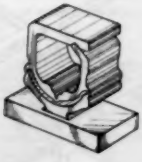


273,656
ROTARY CULTIVATING TOOL
Henry P. Dellinger, 1036 Pineglen Dr., Forest Park, Ga. 30050
Division of Ser. No. 213,189, Dec. 4, 1980, Pat. No. Des. 268,000. This application Jun. 5, 1981, Ser. No. 270,909
The portion of the term of this patent subsequent to Feb. 22, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—8

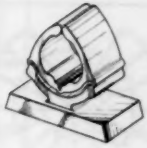


273,657
SCREW STARTER
Robert E. Hanks, 1026 West Vandeveer, Taylorville, Ill. 62568
Filed Jul. 9, 1981, Ser. No. 281,585
Term of patent 14 years
U.S. Cl. D8—82

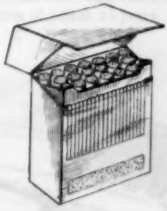
273,658
SNAP-ACTION CLIP
Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi Plastic Industrial Co., Ltd., Tokyo, Japan
Filed Jul. 22, 1981, Ser. No. 286,049
Claims priority, application Japan, Feb. 5, 1981, 56-4197
Term of patent 14 years
U.S. Cl. D8—396



273,659
SNAP-ACTION CLIP
Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi Plastic Industrial Co., Ltd., Shinjuku, Japan
Filed Jul. 22, 1981, Ser. No. 286,051
Claims priority, application Japan, Feb. 5, 1981, 56-4196
Term of patent 14 years
U.S. Cl. D8—396

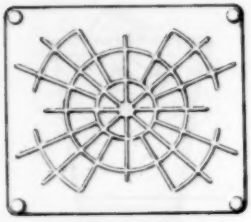


273,660
CIGARETTE PACKAGE
Jan M. Weinberg, 308 Bedford St., Stamford, Conn. 06901
Filed Nov. 2, 1981, Ser. No. 316,811
Term of patent 14 years
U.S. Cl. D9—337



273,661
BOTTLE
Fredi Widmer, Wil, Switzerland, assignor to Hart Chemical Limited, Guelph, Canada
Filed Dec. 2, 1981, Ser. No. 326,931
Claims priority, application Canada, Sep. 15, 1981, 15-09-81-9
Term of patent 14 years
U.S. Cl. D9—374

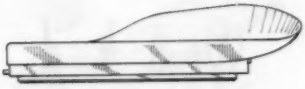
273,662
CONTAINER COVER
Denny Vasilash, 9719 - 84 Ave., Edmonton, Alberta, Canada (T6E 2E8)
Filed Nov. 23, 1981, Ser. No. 324,227
Claims priority, application Canada, Jul. 24, 1981, 24-07-81-7
Term of patent 14 years
U.S. Cl. D9—435



273,663
COMBINED CONTAINER CAP AND APPLICATOR
Evan R. Kahn, 16033 NE. 8th Ave., N. Miami Beach, Fla. 33162
Filed Dec. 17, 1981, Ser. No. 331,554
Term of patent 14 years
U.S. Cl. D9—447

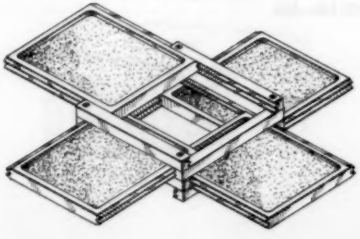
273,664
MICROMETER
Hideo Sakata; Ichiro Mizuno; Masao Nakahara, and Takasi Sanpei, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Feb. 17, 1982, Ser. No. 349,562
Claims priority, application Japan, Aug. 27, 1981, 56-37786
Term of patent 14 years
U.S. Cl. D10—73

273,665
REMOTE READOUT FOOD SCALE
Eugene L. Sly, P.O. Box 19545, Portland, Oreg. 97219, and David C. English, 3822 - 59th Ave., SW., Seattle, Wash. 98116
Division of Ser. No. 82,618, Oct. 9, 1979, abandoned. This application Jul. 12, 1982, Ser. No. 397,016
Term of patent 14 years
U.S. Cl. D10—91

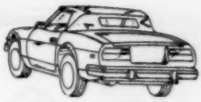


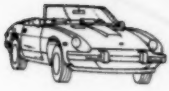
273,666
ORNAMENT FOR A FINGER NAIL
Keiko Hayashi, Tokyo, Japan, assignor to Masami Hayashi and Keiko Hayashi, both of Tokyo, Japan
Filed Feb. 16, 1982, Ser. No. 348,870
Term of patent 14 years
U.S. Cl. D11—1

273,667
PLANTER
Bernard Vuarnesson, 1 Boulevard St-Michel, Paris, France (75005); Minh Luong, 31 rue de Charties, Orsay, France (91400), and Joel Rabinowitz, 5 rue Marmontel, Paris, France (75015)
Filed Dec. 20, 1982, Ser. No. 451,228
Claims priority, application France, Sep. 10, 1982, 823060
Term of patent 14 years
U.S. Cl. D11—155



273,668
ROADSTER
Eugene R. Di Geronimo, III, 2323 SE. 18th St., Fort Lauderdale, Fla. 33316
Filed Jan. 26, 1981, Ser. No. 228,243
Term of patent 14 years
U.S. Cl. D12—92

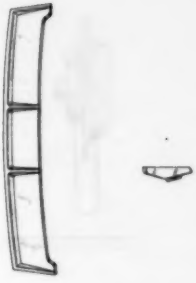




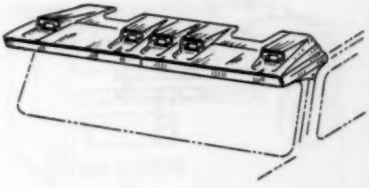
273,669
RECREATIONAL SHELL FOR MOUNTING IN THE BED OF A PICKUP TRUCK
David E. Forbis, 16211 E. Colfax Ave., Aurora, Colo. 80011
Filed Oct. 2, 1981, Ser. No. 307,747
Term of patent 14 years
U.S. Cl. D12—156

273,670
RETRACTABLE TRUCK BOX COVER
Richard E. Keil, 6250 Jefferson Rd., Clark Lake, Mich. 49234
Filed Jan. 7, 1982, Ser. No. 337,853
Term of patent 14 years
U.S. Cl. D12—156

273,671
SPOILER FOR A VEHICLE AND THE LIKE
John B. M. Ford, 17 Moor End Close, Eaton Bray, Dunstable, Bedforshire LU6 2HP, England
Filed Nov. 12, 1981, Ser. No. 320,521
Term of patent 14 years
U.S. Cl. D12—181



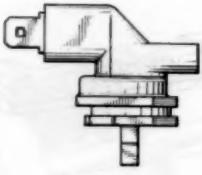
273,672
WINDSHIELD VISOR FOR TRUCKS
Allan W. Lund, 2641-118th Ave. NW., Minneapolis, Minn. 55433
Filed Nov. 25, 1981, Ser. No. 324,775
Term of patent 14 years
U.S. Cl. D12—191



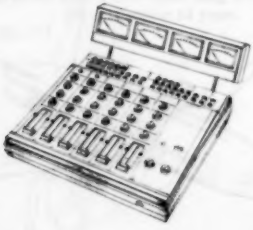
273,673
AIRPLANE
Ray Olason, and Philip C. Whitener, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 30, 1981, Ser. No. 307,343
Term of patent 14 years
U.S. Cl. D12—338

273,674
CABLE T.V. CONNECTOR FOR MARINE VESSEL HULLS OR THE LIKE
Larry L. Brandon, 1309 SW. 5th Ct., Ft. Lauderdale, Fla. 33312
Filed Feb. 23, 1981, Ser. No. 237,574
Term of patent 14 years
U.S. Cl. D13—24

273,675
HEATER END CAP
Eugene T. McKinnon, 16536 Chattanooga Pl., Pacific Palisades, Calif. 90272
Filed May 22, 1980, Ser. No. 152,508
Term of patent 14 years
U.S. Cl. D13—27

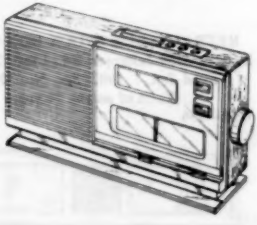


273,676
AUDIO MIXER
Masafumi Itoh; Sigeru Hasegawa; Haruki Takita, all of Musashino, and Kouzi Suzuki, Niza, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Nov. 4, 1981, Ser. No. 318,249
Claims priority, application Japan, Jul. 14, 1981, 56-30928
Term of patent 14 years
U.S. Cl. D14—1

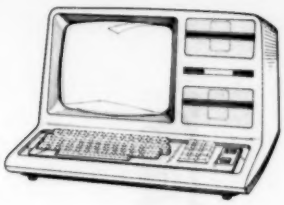


273,677
TELEPHONE SHOULDER REST
Lyle J. Martinsen, Murray, Utah, assignor to Softalk, Inc., Salt Lake City, Utah
Filed Aug. 31, 1981, Ser. No. 297,905
Term of patent 14 years
U.S. Cl. D14—65

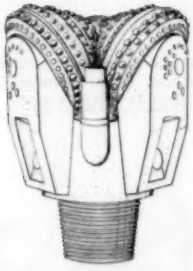
273,678
CLOCK RADIO
Teruyuki Nishimoto, Osaka; Kikuo Ohta, Nara, and Benito Mishiro, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 6, 1981, Ser. No. 309,138
Claims priority, application Japan, Apr. 8, 1981, 56-15028
Term of patent 14 years
U.S. Cl. D14—73



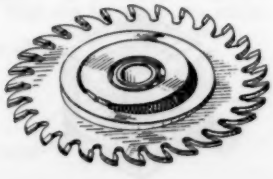
273,679
COMPUTER HOUSING
Bernard A. Grae, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.
Filed Dec. 15, 1980, Ser. No. 216,544
Term of patent 14 years
U.S. Cl. D14—106



273,680
ROLLER BIT
Karl-Erik Kangas, Fagersta, Sweden, assignor to Fagersta AB, Fagersta, Sweden
Filed Apr. 27, 1981, Ser. No. 257,874
Claims priority, application Sweden, Nov. 18, 1980, 80 2298
Term of patent 14 years
U.S. Cl. D15—21

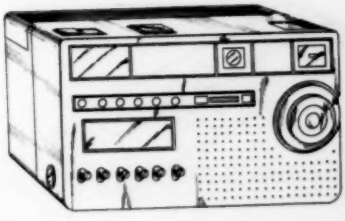


273,681
DADO SAW BLADE
Sotoya Ito, Nagoya, Japan, assignor to Ofuna Industry Co., Ltd., Nishikasugai, Japan
Filed May 14, 1981, Ser. No. 263,591
Claims priority, application Japan, Nov. 17, 1980, 55-48149
Term of patent 14 years
U.S. Cl. D15—133



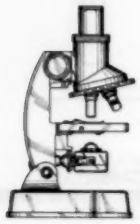
273,682
CUTTING BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 911,739, Jun. 2, 1978, Pat. No. Des. 262,219. This application Jan. 9, 1981, Ser. No. 223,917
Term of patent 14 years
U.S. Cl. D15—139

273,683
COMBINED CAMERA, FLASHLIGHT, AND CLOCK-RADIO
Connie D. Hendren, Rte. 4, Danville Rd., Harrodsburg, and C. Dalton Hendren, Rte. 1, Salvisa, both of Ky. 40330
Filed Oct. 28, 1981, Ser. No. 315,953
Term of patent 14 years
U.S. Cl. D16—1

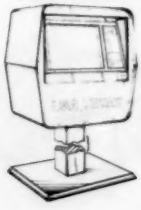


273,684
SPORT GLASSES
Franz Dianitsch, Linz, Austria, assignor to Carrera International Corporation, Norwood, N.J.
Filed Dec. 4, 1980, Ser. No. 212,901
Term of patent 14 years
U.S. Cl. D16—102

273,685
MICROSCOPE
Toshikatsu Yamada, 48-14 Heiwadai, 2-chome, Nerima-ku, Tokyo, Japan (176)
Filed Jul. 6, 1981, Ser. No. 280,666
Term of patent 14 years
U.S. Cl. D16—131

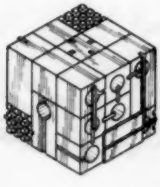


273,686
NEWSPAPER VENDING RACK OR SIMILAR ARTICLE
Fred M. Gore, Dallas, Tex., assignor to Gannett Co., Inc., Rochester, N.Y.
Filed May 12, 1982, Ser. No. 377,475
Term of patent 14 years
U.S. Cl. D20—6

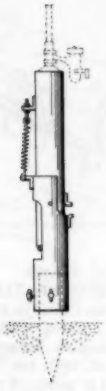


273,687
PANTY HOSE SIZING FORM
Sam C. Safrit, Pfafftown, and William B. Cothran, Burlington, both of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.
Filed Mar. 15, 1982, Ser. No. 358,516
Term of patent 14 years
U.S. Cl. D20—32

273,688
CHESS SET CUBE
Franco Rocco, Via Cappuccio 21, Milano, Italy
Division of Ser. No. 970,258, Dec. 18, 1978. This application Aug. 25, 1980, Ser. No. 181,194
Term of patent 14 years
U.S. Cl. D21—52



273,689
COMBINED FISHING ROD HOLDER AND BITS SIGNALLER
Daniel Rhodes, 84 Lincoln Ave., Dover, N.J. 07801
Filed Jun. 23, 1982, Ser. No. 391,484
Term of patent 14 years
U.S. Cl. D22—13

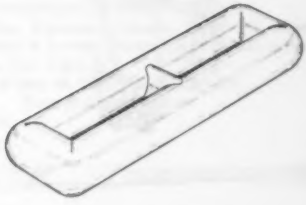


273,690
GRIP FOR FISHING ROD ASSEMBLY
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Sinzuoka, Japan
Filed Oct. 14, 1981, Ser. No. 311,240
Claims priority, application Japan, Jul. 29, 1981, 56-33654
Term of patent 14 years
U.S. Cl. D22—23

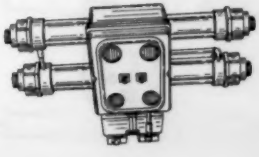
273,691
FISHING ROD GRIP
Masakazu Sakamoto, and Takeshi Shohoji, both of Chiba, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed May 5, 1982, Ser. No. 375,163
Term of patent 14 years
U.S. Cl. D22—23

273,692
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan
Filed Feb. 11, 1982, Ser. No. 348,153
Term of patent 14 years
U.S. Cl. D22—24

273,693
TANK FOR FLUIDS
Robin E. Fossey, Redhills, Ireland, assignor to Container Engineering (Ireland) Limited, Clones, Ireland
Filed Jun. 18, 1981, Ser. No. 275,043
Claims priority, application Ireland, Dec. 23, 1980, 308/80
Term of patent 14 years
U.S. Cl. D23—2

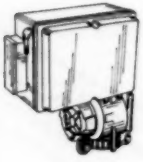


273,694
WATER PURIFICATION IONIC GAS GENERATOR
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed Feb. 10, 1982, Ser. No. 347,520
Term of patent 14 years
U.S. Cl. D23—3

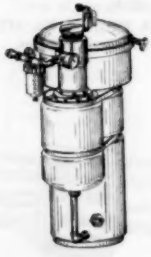


273,695
WATER PURIFICATION IONIC GAS GENERATOR
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed Mar. 22, 1982, Ser. No. 360,163
Term of patent 14 years
U.S. Cl. D23—3

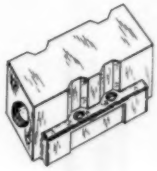
273,696
WATER PURIFICATION IONIC GAS GENERATOR
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed Apr. 5, 1982, Ser. No. 365,275
Term of patent 14 years
U.S. Cl. D23—3



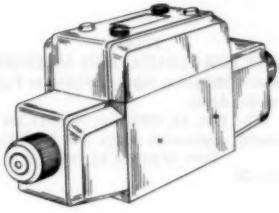
273,697
COMBINATION FILTER AND IONIC GAS GENERATOR ASSEMBLY FOR PURIFYING MACHINE TOOL COOLANTS
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed May 17, 1982, Ser. No. 378,891
Term of patent 14 years
U.S. Cl. D23—3



273,698
VALVE BODY
John Pace, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed Jan. 13, 1981, Ser. No. 224,741
Term of patent 14 years
U.S. Cl. D23—19



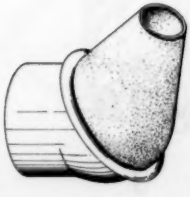
273,699
SOLENOID OPERATED VALVE
Ronald L. Loup, Clarkston; Curtis H. Day, Manchester, both of Mich., and George L. Schick, Easton, Conn., assignors to Double A Products Company, Manchester, Mich.
Filed Mar. 18, 1981, Ser. No. 244,888
Term of patent 14 years
U.S. Cl. D23—19



273,700
BATHTUB FOR INVALIDS OR THE LIKE
Roy Parker, New Milton, England, assignor to National Research Development Corporation, London, England
Filed Dec. 2, 1981, Ser. No. 326,758
Claims priority, application United Kingdom, Jun. 2, 1981, 1000773
Term of patent 14 years
U.S. Cl. D23—56

273,701
TOILET
Hertha A. Bengtson, Mölle, Sweden, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 72,272, Aug. 27, 1979. This application May 26, 1981, Ser. No. 267,217
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 20AR250
Term of patent 14 years
U.S. Cl. D23—67

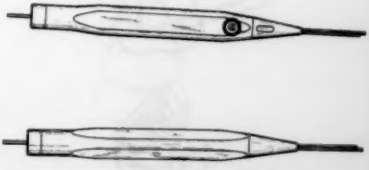
273,702
ADJUSTABLE VENTILATION NOZZLE
Lennart Widerby, and Sven H. Carlsson, both of Jönköping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden
Filed Jun. 16, 1981, Ser. No. 274,073
Claims priority, application Sweden, Dec. 17, 1980, 80-2551
Term of patent 14 years
U.S. Cl. D23—163



273,703
STACKED LIQUID CHEMICAL CONTAINERS
K. Robert Moyse, Doylestown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Jul. 27, 1981, Ser. No. 287,326
Term of patent 14 years
U.S. Cl. D24—1.1

273,704
ORTHOPEDIC SURGERY BRUSH
Joseph E. Miller, Westmunt, Canada; Andrea S. Mandel, Wayne, and Chris B. Lawler, Oakland, both of N.J., assignors to Pfizer, Inc., New York, N.Y.
Filed Oct. 14, 1981, Ser. No. 311,281
Term of patent 14 years
U.S. Cl. D24—26

273,705
SURGICAL ASPIRATION HANDPIECE
Robert F. Spetzler, Shaker Heights, Ohio, and Alfred A. Iversen, Minnetonka, Minn., assignors to PMT, Hopkins, Minn.
Filed Sep. 16, 1982, Ser. No. 419,041
Term of patent 14 years
U.S. Cl. D24—26



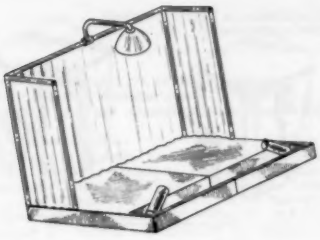
273,706
EAR MOUNTED ELECTRICAL PULSE ACUPRESSURE APPARATUS
Francis J. McCall, 19231 Victory Blvd., Reseda, Calif. 91335
Filed Dec. 17, 1981, Ser. No. 331,617
Term of patent 14 years
U.S. Cl. D24—35

273,707
ELECTRICALLY STIMULATED ACUPRESSURE APPARATUS TO BE LOCATED WITHIN THE EAR
Francis J. McCall, 19231 Victory Blvd., Reseda, Calif. 91335
Filed Dec. 17, 1981, Ser. No. 331,652
Term of patent 14 years
U.S. Cl. D24—35

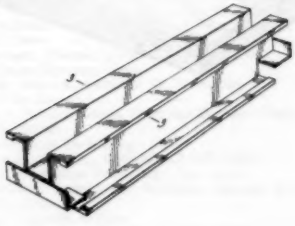
273,708
MASSAGE APPARATUS
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co., Fed. Rep. of Germany
Filed Jul. 9, 1981, Ser. No. 281,631
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 1016 08
Term of patent 14 years
U.S. Cl. D24—36

273,709
URINARY DRAINAGE BAG
Barry L. Schneider, Deerfield, Ill., assignor to Hollister Incorporated, Libertyville, Ill.
Filed Jun. 15, 1981, Ser. No. 273,755
Term of patent 14 years
U.S. Cl. D24—59

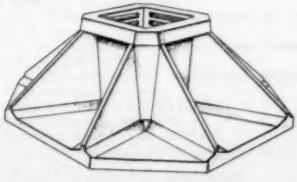
273,710
PORTABLE STAGE
Nathan J. LeBlanc, 3252 Anita Ct., Castro Valley, Calif. 94541
Filed Apr. 6, 1981, Ser. No. 251,384
Term of patent 14 years
U.S. Cl. D25—58



273,711
BEAM
George B. A. Young, Sturmer, near Haverhill, England, assignor to Acrow (Engineers) Limited, London, England
Filed Nov. 20, 1981, Ser. No. 323,451
Claims priority, application United Kingdom, Jun. 8, 1981, 1000861
Term of patent 14 years
U.S. Cl. D25—73



273,712
BASE FOR A COLUMN
Claes Ahlqvist, Mollevagen 11, S-282 00 Tyringe, Sweden
Filed Nov. 17, 1981, Ser. No. 322,308
Term of patent 14 years
U.S. Cl. D25—77



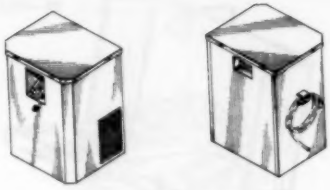
273,713
PIPE
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Aug. 5, 1982, Ser. No. 405,353
Term of patent 14 years
U.S. Cl. D27—03

273,714
PIPE
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Aug. 5, 1982, Ser. No. 405,356
Term of patent 14 years
U.S. Cl. D27—3

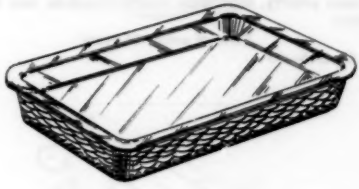
273,715
PIPE
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Aug. 5, 1982, Ser. No. 405,532
Term of patent 14 years
U.S. Cl. D27—3

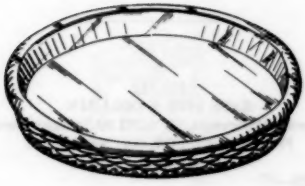
273,716
ADJUSTABLE COSMETIC APPLICATOR
Gino H. Cassai, 924 East 96th St., Brooklyn, N.Y. 11236, and Henry J. Cassai, 88-10 97th Ave., Ozone Park, N.Y. 11416
Filed Jun. 3, 1982, Ser. No. 384,653
Term of patent 14 years
U.S. Cl. D28—7

273,717
COMPACT MEDICAL OXYGEN CONCENTRATOR
Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Inc., Tonawanda, N.Y.
Filed Aug. 28, 1981, Ser. No. 297,362
Term of patent 14 years
U.S. Cl. D29—06



273,718
CAT LITTER BOX
Elizabeth Dugan, 132 Woodside Village, Apt. #1B, Stamford, Conn. 06905
Filed Oct. 3, 1980, Ser. No. 193,641
Term of patent 14 years
U.S. Cl. D30—99





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Rohe GmbH: *See*—
Staudinger, Alfons, 4,445,278, Cl. 33-203.120.

AB Karlstads Mekaniska Werkstad: *See*—
Banner, Kurt A.; and Gustafsson, Sten-Ake, 4,445,558, Cl. 144-341.000.

Abaskalov, Vladimir D.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Abdallah, Mohamed G.; and McDonald, William M., to Exxon Production Research Co. Method and apparatus for remote recovery of submerged pipelines. 4,445,804, Cl. 405-173.000.

Abe, Hiroshi: *See*—
Mizusaki, Takashi; Matsuo, Tadayuki; Esashi, Masayoshi; and Abe, Hiroshi, 4,446,474, Cl. 357-25.000.

Abe, Toshiro: *See*—
Ogawa, Naoki; and Abe, Toshiro, 4,445,472, Cl. 123-198.00E.

Abernethy, Dennis: *See*—
Hyde, Bruce; Tyndall, Wayne; Abernethy, Dennis; and Mellgren, Per G., 4,445,552, Cl. 144-3.00D.

Abou-Gharbia, Magid: *See*—
Freed, Meier E.; and Abou-Gharbia, Magid, 4,446,323, Cl. 544-344.000.

Acme Engineering & Manufacturing Corporation: *See*—
Bohanon, Hoy R., Sr., 4,445,426, Cl. 98-116.000.

Acorn Equipment Corp.: *See*—
Zyduck, Ronald L., 4,445,823, Cl. 417-430.000.

Action Concepts, Inc.: *See*—
Gooding, Robert J., 4,445,358, Cl. 72-416.000.

Adams, Ronald W.; Leunig, Carl V.; and Kovar, Robert F., to Albany International Corp. Method of manufacturing molded upholstery panels. 4,445,954, Cl. 156-148.000.

Adlerborn, Jan; Larker, Hans; Mattsson, Bertil; and Nilsson, Jan, to ASEA AB. Method of manufacturing an object of metallic or ceramic material. 4,446,100, Cl. 419-48.000.

Adna AG: *See*—
Truninger, Thomas, 4,445,588, Cl. 180-233.000.

Adolph Coors Company: *See*—
Stirbis, James S., 4,445,431, Cl. 101-40.000.

Adrian, Fritz: *See*—
Bassier, Friedr.; Adrian, Fritz; and Deuster, Dieter, 4,445,937, Cl. 106-109.000.

Advanced Circuit Technology: *See*—
Roberts, Joseph A., 4,446,342, Cl. 200-5.00R.

Advanced Mechanical Technology, Inc.: *See*—
Gerstmann, Joseph; and Vasilakis, Andrew D., 4,445,464, Cl. 122-16.000.

Aeroquip Corporation: *See*—
Allread, Alan R., 4,445,664, Cl. 251-149.200.

Afzali-Ardakani, Ali; Crowley, John I.; and Wu, Anthony W., to International Business Machines Corporation. Process for chemically bonding lubricant to an information carrier and products thereof. 4,446,193, Cl. 428-422.000.

Agency of Industrial Science and Technology: *See*—
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, 4,445,934, Cl. 75-68.00A.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; and Strauss, Jurgen, 4,446,219, Cl. 430-216.000.

Agip Petroli S.p.A.: *See*—
Carbonaro, Antonio; Ferrero, Cesare; and Corbellini, Margherita, 4,446,289, Cl. 526-142.000.

Ahlbrandt, Andreas. Treating the surface of articles by electrical brush discharge. 4,446,110, Cl. 422-186.050.

Ahmann, John E. Portable voting booth. 4,445,731, Cl. 312-223.000.

Ahmed, Salah E.: *See*—
Shah, Syed M. M.; Luksas, Anthony J.; and Ahmed, Salah E., 4,446,055, Cl. 252-351.000.

Aigoo, Seiichiro. Dehydrating drier. 4,445,281, Cl. 34-58.000.

AIOI Seiki Kabushiki Kaisha: *See*—
Kitaura, Ichiro, 4,445,675, Cl. 269-20.000.

Air Products and Chemicals, Inc.: *See*—
Chiu, Chen-Hwa, 4,445,917, Cl. 62-25.000.
Eskinazi, Victoria; and Wells, James E., 4,446,320, Cl. 544-106.000.

Air-Shields, Inc.: *See*—
Wenstrup, Jan F., 4,445,827, Cl. 417-477.000.

Aird, Alanson D., to General Electric Company. Optocoupler having folded lead frame construction. 4,446,375, Cl. 250-551.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Hayashi, Kenji; and Kato, Kiyoshi, 4,445,820, Cl. 417-366.000.

Aisin Seiki Co., Ltd.: *See*—
Kuzuya, Kaneharu; Ishida, Giichi; and Ishizaki, Kosho, 4,445,449, Cl. 112-121.110.

Aisin Seiki Kabushiki Kaisha: *See*—
Ohmi, Atsushi; and Ochiai, Chiaki, 4,445,425, Cl. 92-98.00D.

Aisin Warner Kabushiki Kaisha: *See*—
Miki, Nobuaki; and Yokoyama, Shoji, 4,445,528, Cl. 137-315.000.

Akiba, Kiyoshi: *See*—
Sasaki, Takeshi; Akiba, Kiyoshi; and Takahashi, Yoshio, 4,445,399, Cl. 74-603.000.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Stenberg, Erik G., 4,445,974, Cl. 162-300.000.

Aktiebolaget Sr Eriks Betong: *See*—
Lo v, Bjorn, 4,445,802, Cl. 404-40.000.

Alaspa, Allan A., to Motorola, Inc. Low leakage CMOS analog switch circuit. 4,446,390, Cl. 307-579.000.

Albany International Corp.: *See*—
Adams, Ronald W.; Leunig, Carl V.; and Kovar, Robert F., 4,445,954, Cl. 156-148.000.

Albares, Donald J.: *See*—
McLandrich, Matthew N.; and Albares, Donald J., 4,446,543, Cl. 367-149.000.

Albers, Josef: *See*—
Linke, Horst; Albers, Josef; and Erwien, Helmut, 4,445,878, Cl. 474-92.000.

Albert, William C., to Singer Company, The. Linearizing mechanism for a vibrating beam force transducer. 4,446,394, Cl. 310-321.000.

Albertson, Clarence E.: *See*—
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,446,203, Cl. 428-283.000.

Albertson, Walter, to Union Oil Company of California. Arsenic removal from hydrocarbons. 4,446,006, Cl. 208-253.000.

Aldag, Arthur W., Jr., to Phillips Petroleum Company. Catalytic skeletal isomerization. 4,446,013, Cl. 208-135.000.

Alexander, Michael C., to Data General Corporation. Video terminal character generator. 4,446,457, Cl. 340-745.000.

Allegheny Valve Company: *See*—
DeFrees, Joseph H., 4,445,533, Cl. 137-512.100.

Allen-Bradley: *See*—
Hoch, Thomas M.; and Kullgren, Dennis R., 4,446,525, Cl. 364-474.000.

Allen, Linus S.: *See*—
Givens, Wyatt W.; and Allen, Linus S., 4,446,369, Cl. 250-270.000.

Allert, Kurt. Hose band clip. 4,445,254, Cl. 24-274.00R.

Allied Corporation: *See*—
Murthy, Andiappan K. S.; Patel, Kundanbhai M.; and Bekker, Alex Y., 4,446,012, Cl. 208-130.000.
Oxenrider, Bryce C., 4,446,306, Cl. 528-366.000.

Allied Steel and Wire Limited: *See*—
Taylor, Leonard G., 4,445,308, Cl. 52-687.000.

Allis-Chalmers Corporation: *See*—
Farnia, Khosrow, 4,445,461, Cl. 122-7.00R.

Allread, Alan R., to Aeroquip Corporation. Axial force operated ball valve. 4,445,664, Cl. 251-149.200.

Allsopp, Lewis E.: *See*—
Westerman, Howard G.; and Allsopp, Lewis E., 4,445,467, Cl. 123-65.00R.

Allsup, Robert B.: *See*—
Pyne, Melvin L.; and Allsup, Robert B., 4,445,430, Cl. 100-35.000.

Aloe Vera of America, Inc.: *See*—
Maughan, Rex G., 4,446,131, Cl. 424-195.000.

Alphatype Corporation: *See*—
Tidd, James A.; and Tidd, Miles H., 4,446,491, Cl. 360-48.000.

Alps Electric Co., Ltd.: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.

Alumina Development Corporation: *See*—
McDaniel, James W., 4,446,117, Cl. 423-121.000.

Alvarez, Manuel: *See*—
Betermier, Benedicte; Alvarez, Manuel; and Norris, Robert D., 4,446,029, Cl. 210-748.000.

ALZA Corporation: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,445,889, Cl. 604-49.000.

Amagami, Keizo: *See*—
Mizukawa, Takumi; Amagami, Keizo; and Ogino, Yoshio, 4,446,350, Cl. 219-10.770.

American Cyanamid Company: *See*—
Cady, Susan M.; Blank, Werner J.; and Schirmann, Peter J., 4,446,280, Cl. 525-186.000.

American Hoechst Corporation: *See*—
Dhillon, Major S., 4,446,218, Cl. 430-175.000.
American Hofmann Corporation: *See*—
Mueller, Richard, 4,445,373, Cl. 73-473.000.
American Home Products Corporation: *See*—
Freed, Meier E.; and Abou-Gharbia, Magid, 4,446,323, Cl. 544-344.000.
Stein, Reinhardt P., 4,446,322, Cl. 544-138.000.
American Hospital Supply Corporation: *See*—
Johnson, Clifford C., 4,445,858, Cl. 433-141.000.
American Motors Corporation: *See*—
Mancusi, Fred, 4,445,616, Cl. 211-13.000.
American Stabilis, Inc.: *See*—
Peters, Donald, 4,445,636, Cl. 236-20.00R.
AMF Incorporated: *See*—
Frillici, Fernando V.; and Infantino, Joseph R., 4,445,688, Cl. 273-82.00R.
AMP Incorporated: *See*—
Evans, William R., 4,445,748, Cl. 339-94.00M.
Grabbe, Dimitry G., 4,445,271, Cl. 29-589.000.
Hoffman, Joseph W., 4,445,716, Cl. 285-55.000.
Hopkins, John R., 4,445,736, Cl. 339-17.0CF.
Long, William B.; Metzger, Donald L.; and Shuey, John R., 4,445,737, Cl. 339-18.00C.
Long, William B.; and Shannon, Suel G., 4,446,505, Cl. 361-413.000.
Ampex Corporation: *See*—
Williams, Marshall; and O'Gwynn, David C., 4,446,389, Cl. 307-515.000.
AMSTED Industries Incorporated: *See*—
Tilly, Lynn K.; and Sawa, John J., 4,445,439, Cl. 105-165.000.
Anderson Company of Indiana, The: *See*—
Harbison, William H.; and Mohnach, Michael G., 4,445,249, Cl. 15-250.320.
Anderson, Greenwood & Co.: *See*—
Powell, Walter W., 4,445,531, Cl. 137-489.000.
Andersson, Albert, to Skega AB. Track unit of bogie type. 4,445,582, Cl. 180-9.500.
Ando, Takao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.
Angel, Thomas M., to Santa Fe International Corporation. Autonomous cleaning inspection device. 4,445,524, Cl. 134-113.000.
Angeles, Marshall R., to Merck & Co., Inc. Method of preparing 1,2-dibromo-2-cyano-(substituted)-alkane antimicrobial compounds. 4,446,076, Cl. 260-465.00G.
Angmorter, Paul K.: *See*—
Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., 4,446,248, Cl. 502-211.000.
Angwin, Richard B., to Laminations Corporation. Bullet trap. 4,445,693, Cl. 273-404.000.
Annoot, Ira R., to Houston Geophysical Products, Inc. Double-plug seismic connector. 4,445,741, Cl. 339-49.00R.
Antognini, Luciano-Marco: *See*—
Remus, Hans-Jurgen; and Antognini, Luciano-Marco, 4,446,413, Cl. 318-696.000.
Aoki, Keiji; and Takimoto, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for controlling the air-fuel ratio of an internal combustion engine. 4,445,481, Cl. 123-440.000.
Aoki, Takao; and Inoue, Takahiro, to Canon Kabushiki Kaisha. Electronic photographing device. 4,445,772, Cl. 355-3.0CH.
Aoshima, Atsushi; and Mitsui, Ryoichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing methacrolein. 4,446,328, Cl. 568-479.000.
Apel, Thomas R., to Rockwell International Corporation. Singly terminated push-pull distributed amplifier. 4,446,445, Cl. 330-269.000.
Apple Computer, Inc.: *See*—
Smith, Burrell, 4,445,414, Cl. 84-1.010.
Applied Power Inc.: *See*—
Clark, Ray, 4,445,673, Cl. 267-64.240.
Arbit, Harold A., to Mobil Oil Corporation. Enhanced wettability of organic surfaces. 4,445,991, Cl. 204-168.000.
Arc Technologies Systems, Ltd.: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, 4,446,561, Cl. 373-93.000.
ARCO Industries Ltd.: *See*—
D'Andrade, Bruce M.; Ng, Ping F.; and Ma, Tak M., 4,445,297, Cl. 46-230.000.
Arena, Alan J.; Pounder, Edwin; Pawlowski, Michael; and Totten, Adrian M., to Signet Scientific Co. Post mix dispensing method and apparatus. 4,445,781, Cl. 366-154.000.
Arimura, Kazuo: *See*—
Nishihara, Masao; Matsuhita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.
Arinobu, Mutsuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Steam condensing apparatus. 4,446,081, Cl. 261-64.00R.
Armah, Ben: *See*—
Cohnen, Erich; and Armah, Ben, 4,446,142, Cl. 424-269.000.
Armco Inc.: *See*—
Cerwick, Joel A., 4,446,018, Cl. 210-195.400.
Cowan, William S., 4,445,807, Cl. 405-227.000.
Armijo, Joseph S.: *See*—
Cheng, Bo-Ching; Rosenbaum, Herman S.; and Armijo, Joseph S., 4,445,942, Cl. 148-6.300.
Armstrong World Industries, Inc.: *See*—
Bohrn, Walter J.; and Sydorko, Peter J., 4,445,243, Cl. 8-151.000.
Arndt, Frederick P.: *See*—
Oakes, Edmond G.; Arndt, Frederick P.; and Grandel, Leonard F., 4,445,708, Cl. 280-777.000.
Arnold, Robert G.: *See*—
Lutfy, Joseph P.; Grabowski, Thaddeus J.; and Arnold, Robert G., 4,445,979, Cl. 204-15.000.
Aronson, Terry L., to Leggett & Platt, Incorporated. Lacing wire stop mechanism for a coil spring assembly machine. 4,445,547, Cl. 140-92.300.
Arribas, Cecilio; and Blassiau, Rene E., to Noirot-MT. Peak load control for an electric heating system. 4,446,359, Cl. 219-485.000.
Arrow Paper Products Company: *See*—
Stark, Martin H.; Pisani, George V.; and Panquette, James J., 4,445,691, Cl. 273-155.000.
Arya, Satya P., to Ingersoll-Rand Company. Mine roof plate. 4,445,808, Cl. 405-259.000.
Asahi-Dow Limited: *See*—
Fukuda, Kunio; Tazaki, Kichiya; Takano, Akihisa; and Kusumi, Yuji, 4,446,272, Cl. 524-465.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Aoshima, Atsushi; and Mitsui, Ryoichi, 4,446,328, Cl. 568-479.000.
Ikematu, Takeshi; and Hattori, Yasuo, 4,446,290, Cl. 526-174.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Enomoto, Shigeo; Hirobe, Hitoshi; and Urata, Shinji, 4,445,757, Cl. 350-429.000.
Iwanade, Hisao, 4,446,526, Cl. 364-525.000.
ASEA AB: *See*—
Adlerborn, Jan; Larker, Hans; Mattsson, Bertil; and Nilsson, Jan, 4,446,100, Cl. 419-48.000.
ASEA Aktiebolag: *See*—
Brogardh, Torgny; Ovren, Christer; and Sander, Lars, 4,446,366, Cl. 250-227.000.
Assaf, Gad; and Cohen, Yehuda, to Solmat Systems Ltd. Method of and apparatus for pre-treating make-up water contaminated with nutrients. 4,446,025, Cl. 210-602.000.
Asto Import- und Exportgesellschaft M.B.H. & Co. Kg.: *See*—
Nentwig, Jurgen, 4,445,311, Cl. 53-575.000.
Asulab S.A.: *See*—
Remus, Hans-Jurgen; and Antognini, Luciano-Marco, 4,446,413, Cl. 318-696.000.
AT&T Technologies, Inc.: *See*—
Koehler, Paul G.; Leahy, Thomas P.; and Lichliter, Thomas P., 4,446,422, Cl. 324-54.000.
Athey, Roderick E.; and Furnish, Alan G., to Marley Company. Boiler feed water deaerator spray valve turbulence shield. 4,445,537, Cl. 137-572.000.
Atlantic Richfield Company: *See*—
Perkins, Thomas K., 4,445,575, Cl. 166-290.000.
Atlas Powder Company: *See*—
Oswald, Gerald L., 4,445,435, Cl. 102-215.000.
Atsumi, Masaharu: *See*—
Kishimoto, Satoru; Atsumi, Masaharu; and Sano, Yoshiaki, 4,446,499, Cl. 361-92.000.
Atwell, William L., to Leco Corporation. Sampling tube and apparatus. 4,445,390, Cl. 73-864.520.
Auchterlonie, Richard C. High speed plasma focus fusion reactor. 4,446,096, Cl. 376-145.000.
Audichron Company, The: *See*—
Cofer, Frank H., 4,446,337, Cl. 179-18.00B.
Auditore-Hargreaves, Karen; and Miesowicz, Frederick M., to Du Pont de Nemours, E. I., and Company. Homogeneous immunoassay using covalent hybrid antibodies. 4,446,233, Cl. 435-7.000.
Aufderhaar, Erhard; Feller, Johannes; Hultsch, Gunther; and Kisslinger, Walter, to Krauss-Maffei Aktiengesellschaft. Filter-medium support plate for centrifugal filter. 4,446,021, Cl. 210-378.000.
Austin, Peter W.: *See*—
Foster, Stephen R.; and Austin, Peter W., 4,445,424, Cl. 92-5.00R.
Auth, David C. Method and apparatus for removal of enclosed abnormal deposits. 4,445,509, Cl. 128-305.000.
Avra, Raymond E.; and Herrington, Lawrence, to MegaTape Corporation. High speed bidirectional magnetic tape transport with constant tension. 4,445,650, Cl. 242-192.000.
AVX Corporation: *See*—
Scrantom, Dehart G.; and Rutt, Truman C., 4,445,851, Cl. 432-239.000.
Ayerst, McKenna & Harrison, Inc.: *See*—
Sestanj, Kazimir; and Bellini, Francesco, 4,446,150, Cl. 424-270.000.
Aymard, Pierre: *See*—
Dewitte, Jean; and Aymard, Pierre, 4,446,207, Cl. 428-402.000.
B. F. Goodrich Company, The: *See*—
Eden, Jamal S., 4,446,249, Cl. 502-225.000.
Felder, Gregory F., 4,445,962, Cl. 156-398.000.
Kolycheck, Edmond G.; and Tolle, Laura L., 4,446,286, Cl. 525-455.000.
Mattson, William F., 4,446,093, Cl. 264-315.000.
Babcock & Wilcox Company, The: *See*—
Nielsen, John M., 4,445,386, Cl. 73-780.000.
Babsch, Alfred; and Lohrmann, Gerhard, to Mannesmann AG. Pulse-producing transducer. 4,446,367, Cl. 250-231.0SE.
Bachelis, Leonid V.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Backhouse, Richard J., to National Research Development Corporation. Stored program digital data processor. 4,446,533, Cl. 364-900.000.

Backof, Charles A., Jr., to Motorola, Inc. CVSD Transmission with improved intelligibility of voice signals. 4,446,565, Cl. 375-32.000.

Bacuvier, Pierre, to Le Silicium Semiconducteur SSC. Assembly in a single case of a main power-switching semiconductor component and a destorage diode. 4,446,478, Cl. 357-75.000.

Badoz, Janine; Bardin, Michelle; Bernard, Claude; Herlem, Michel; Robert, Guy; and Thiebault, Andre, to Electricite de France (Service National). Electrochemical generator comprising an ammoniate. 4,446,215, Cl. 429-190.000.

Baertsch, Richard D.; and Engeler, William E., to General Electric Company. Surface charge signal processing apparatus. 4,446,532, Cl. 364-824.000.

Bahjat, Dhari S.: *See*—
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,446,434, Cl. 324-363.000.

Baka Manufacturing Company, Inc.: *See*—
Kovacs, Joseph, 4,445,894, Cl. 604-179.000.

Baker Cac, Inc.: *See*—
Foster, Stephen R.; and Austin, Peter W., 4,445,424, Cl. 92-5.00R.

Baker, Carl R. Auxiliary power supply switching set. 4,446,376, Cl. 290-44.000.

Baker International Corporation: *See*—
Fineberg, Douglas H.; and Haynes, Andrew, 4,445,572, Cl. 166-188.000.

Baker, Richard A.; Forsythe, George D.; Likhyani, Kewal K.; Roberts, Robert E.; and Robertson, David C., to Du Pont de Nemours, E. I., and Company. Hollow filament product. 4,446,024, Cl. 210-500.200.

Baker, Richard W.; and Ninomiya, Yasuo, to Bend Research, Inc. Controlled-release dispenser. 4,445,641, Cl. 239-6.000.

Bakke, Even, to Peabody Process Systems, Inc. System for dry scrubbing of flue gas. 4,446,109, Cl. 422-168.000.

Bakker, Willem F., to Breeze Illinois, Incorporated. Quick disconnect connector with positive locking device. 4,445,743, Cl. 339-90.00R.

Bales, Randy L. Yellow gold jewelry alloy. 4,446,102, Cl. 420-507.000.

Balfour Lumber Company: *See*—
Coleman, Cecil A., 4,445,559, Cl. 144-363.000.

Ball Value Co., Inc.: *See*—
Bunn, Stuart E.; and Owsley, Herbert B., 4,445,824, Cl. 417-440.000.

Baltare, Gunnar, to Eaton Corporation. Spider assembly for drum brake. 4,445,597, Cl. 188-206.00A.

Baltzer, William W.: *See*—
May, Earl L.; and Baltzer, William W., 4,445,924, Cl. 65-182.300.

Banerian, Carl. Tool for a method of forming dimples in sheet metal for recessing rivet heads. 4,445,264, Cl. 29-445.000.

Banner, Kurt A.; and Gustafsson, Sten-Ake, to AB Karlstads Mekaniska Werkstad. Barking drum and method. 4,445,558, Cl. 144-341.000.

Baracskai, Jozsef: *See*—
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.

Barber, Bob, Jr.: *See*—
Parker, David L., 4,445,404, Cl. 81-62.000.

Bardin, Michelle: *See*—
Badoz, Janine; Bardin, Michelle; Bernard, Claude; Herlem, Michel; Robert, Guy; and Thiebault, Andre, 4,446,215, Cl. 429-190.000.

Bardl, Artur, to Siemens Aktiengesellschaft. Semiconductor circuit with clock-controlled charge displacement devices. 4,446,485, Cl. 358-213.000.

Bardsley, Harold B.; and Beverley, Ian, to Spencer Wright Industries, Inc. Tufting machine apparatus. 4,445,447, Cl. 112-79.00R.

Barge, Fred H. Chiropractic adjustment table. 4,445,504, Cl. 128-70.000.

Bargman, Ronald D. Differential pressure indicator. 4,445,457, Cl. 116-268.000.

Barkow, Alice: *See*—
Chiaramonte, Vincent; and Barkow, Alice, 4,445,862, Cl. 433-191.000.

Baron, Arthur L.: *See*—
Krishnan, Sivaram; and Baron, Arthur L., 4,446,297, Cl. 528-204.000.

Baron, Walter J.; and Cleaver, Laird C., to Water Services of America, Inc. Sleeve-type fluid flow diverter. 4,445,540, Cl. 137-625.430.

Barozzi, Gian P.; and Horeschi, Giancarlo, to Tokyo Juki Industrial Co., Ltd. Impact control for carrier mounted serial printers. 4,445,797, Cl. 400-166.000.

Barr, Arthur C. Two way mailing envelope. 4,445,635, Cl. 229-73.000.

Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company, The. Fabric conditioning compositions containing amino-silanes. 4,446,033, Cl. 252-8.600.

Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company, The. Cleansing agents and the like with amino-silanes. 4,446,035, Cl. 252-8.800.

Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., to Glasteel Tennessee, Inc. Copper-clad polyester-glass fiber laminates using zinc-coated copper. 4,446,173, Cl. 427-206.000.

Barshter, Dennis W., to Kennecott Corporation. Resistance-heated boat for metal vaporization. 4,446,357, Cl. 219-275.000.

Barteiloni, Rene, to Papeteries de Jean d'Heurs. Process for the continuous manufacture in an aqueous medium of sheets made of fibrous material and containing latex or similar and/or phenoplasts or aminoplasts, sheets obtained by said process and their possible re-use. 4,445,972, Cl. 162-164.100.

Bartholic, David B., to Engelhard Corporation. Selective vaporization process and apparatus. 4,446,009, Cl. 208-113.000.

Bartley, Burton H.: *See*—
Petty, Randall H.; and Bartley, Burton H., 4,446,010, Cl. 208-120.000.

Bartley, William J.; and Wilson, Thomas P., to Union Carbide Corporation. Process for producing two-carbon atom oxygenated compounds from synthesis gas with minimal production of methane. 4,446,251, Cl. 518-716.000.

Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, to Ciba-Geigy Corporation. Antigen derivatives and processes for their preparation. 4,446,128, Cl. 424-88.000.

BASF Aktiengesellschaft: *See*—
Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, 4,446,277, Cl. 525-68.000.
Graser, Fritz, 4,446,324, Cl. 546-37.000.
Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, 4,446,253, Cl. 521-79.000.
Strehler, Hugo; Valentin, Guenter; and Hoerauf, Werner, 4,446,089, Cl. 264-178.00F.

Bassier, Friedr.; Adrian, Fritz; and Deuster, Dieter, to Ruhrkohle AG; and Steag AG. Pneumatic stowing of construction material comprising calcium alpha- and beta-sulphate hemihydrates. 4,445,937, Cl. 106-109.000.

Battelle Memorial Institute: *See*—
Giddey, Claude; and Dove, Georges, 4,446,166, Cl. 426-631.000.

Baum, Heinz W., to Lucas Industries Limited. Disc brake pad assemblies. 4,445,595, Cl. 188-73.380.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,446,201, Cl. 428-696.000.

Baumgartner, Hans; and Schmitz, Eckehard, to Pierburg GmbH & Co. KG. Engine idling speed control systems. 4,445,475, Cl. 123-339.000.

Bausch & Lomb Incorporated: *See*—
Emmel, Henry J., 4,445,758, Cl. 350-530.000.

Baxter, William J., to General Motors Corporation. Method of manufacturing gel electrode for early detection of metal fatigue. 4,445,999, Cl. 204-414.000.

Bay, Otto. Apparatus for transporting single sheets of different rectangular formats. 4,445,679, Cl. 271-227.000.

Bayer Aktiengesellschaft: *See*—
Binsack, Rudolf; Lindner, Christian; Rempel, Dieter; and Ott, Karl-Heinz, 4,446,276, Cl. 525-64.000.
Brack, Alfred, 4,446,326, Cl. 548-438.000.
Bucheler, Manfred; Klinksiek, Bernd; Gehringer, Hans; and Schnoring, Hildegard, 4,446,127, Cl. 424-59.000.
Hombach, Rudolf; Nolte, Wilfried; Russell, Peter J.; and Wall, Nigel G., 4,445,959, Cl. 156-332.000.
Jager, Horst; and Wunderlich, Klaus, 4,446,067, Cl. 260-153.000.
Kolbe, Joachim; Kortmann, Wilfried; and Pfeiffer, Josef, 4,446,034, Cl. 252-8.800.
Konig, Eberhard; Thoma, Wilhelm; Pedain, Josef; and Konig, Klaus, 4,446,293, Cl. 528-45.000.
Konig, Joachim; Schnalke, Karl-Erwin; Suling, Carlhans; and Horacek: Gotz, 4,446,291, Cl. 526-209.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,445,930, Cl. 71-105.000.

Beale, Alvin F., Jr., to Dow Chemical Company, The. Chromium oxide in ion exchange resin. 4,446,252, Cl. 521-28.000.

Beales, Keith J.; Partington, Sally; and Dunn, Anthony G., to Post Office. Glass optical fibres and glass compositions therefor. 4,445,754, Cl. 350-96.340.

Beall, Michael D.: *See*—
Reynolds, Louis E.; and Beall, Michael D., 4,445,382, Cl. 73-716.000.

Beasley, Max M., to Tuftco Corporation. Knife holder module for cut pile tufting machine. 4,445,446, Cl. 112-79.00R.

Beatrice Foods Co.: *See*—
Shah, Syed M. M.; Luksas, Anthony J.; and Ahmed, Salah E., 4,446,055, Cl. 252-351.000.

Beavan, Stuart W.; and Willis, Edwin, to Lever Brothers Company. Fabric conditioning composition. 4,445,901, Cl. 8-103.000.

Becker, John V. Tactile communication. 4,445,871, Cl. 434-114.000.

Becker, Larry W., to Betz Laboratories, Inc. Isopropenyl phosphonic acid copolymers used to inhibit scale formation. 4,446,028, Cl. 210-697.000.

Becker, Larry W., to Betz Laboratories, Inc. Poly (alkenyl) phosphonic acid and methods of use thereof. 4,446,046, Cl. 252-181.000.

Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, to W. Schlafhorst & Co. Method and device for making a knot-free thread connection by splicing. 4,445,318, Cl. 57-22.000.

Beckerle, John C. Oceanographic measurement system. 4,446,542, Cl. 367-131.000.

Beckman, Wayne C.; and Harwell, Patrick E., to Global Marine Inc. Apparatus for measurement of ice movement. 4,445,395, Cl. 74-501.00R.

Bedier, Pierre C. A., to Societe Breilly S.A. Panty-hose with an elastic belt incorporated therein and method. 4,445,345, Cl. 66-177.000.

Beecham Group Limited: *See*—
Southgate, Robert; Smale, Terence C.; and Ponsford, Roger J., 4,446,146, Cl. 424-274.000.

Beecham Group Limited of Beecham House: *See*—
Luk, Kong, 4,446,069, Cl. 260-245.20R.

Beecham Group p.l.c.: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,446,113, Cl. 422-267.000.

Beier, Stefan, to Kaltenbach & Voigt GmbH & Co. Dental treatment apparatus. 4,446,456, Cl. 340-706.000.

Beiersdorf Aktiengesellschaft: *See*—
Cohnen, Erich; and Armah, Ben, 4,446,142, Cl. 424-269.000.

Bekey, Ivan; and Wolk, Roger S. Apparatus for constructing registered teeth castings. 4,445,854, Cl. 433-37.000.

Bekker, Alex Y.: *See*—
Murthy, Andiappan K. S.; Patel, Kundanbhai M.; and Bekker, Alex Y., 4,446,012, Cl. 208-130.000.

Belko, Robert P.: *See*—
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,446,060, Cl. 252-522.00R.

Bell, Claude: *See*—
Kubic, Nick; Bell, Claude; and Seguin, Serge, 4,445,619, Cl. 220-263.000.

Bell Petroleum Services, Inc.: *See*—
von Bose, Robert J., 4,446,539, Cl. 367-25.000.

Bell, R. Frank, to Hewlett-Packard Company. Dual mode amplifier. 4,446,440, Cl. 330-10.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bethel, Leslie D.; Kerr, Howard A.; Strebendt, Frances B.; and Waninski, John E., Jr., 4,446,336, Cl. 179-6.100.
Dick, George W., 4,446,402, Cl. 313-586.000.
Rubin, Harvey, 4,446,341, Cl. 179-175.20R.
Smith, Craig G., 4,445,980, Cl. 204-15.000.

Bellini, Francesco: *See*—
Sestanj, Kazimir; and Bellini, Francesco, 4,446,150, Cl. 424-270.000.

Bello, Paul. Pipe carousel for well-drilling rig. 4,445,579, Cl. 175-52.000.

Beloit Corporation: *See*—
Karr, Gerald W.; and Wong, George H., 4,445,646, Cl. 242-56.00R.

Belote, Stephen N.; Leonard, Don R.; and Luce, Garrett C., to Eastman Kodak Company. Modified polyesters. 4,446,301, Cl. 528-295.300.

Bemcor, Inc.: *See*—
Lazar, John D., Jr.; and Shvartsman, Benyamin, 4,445,410, Cl. 83-390.000.

Ben Clements & Sons, Inc.: *See*—
Ueno, Hideyuki, 4,445,882, Cl. 493-376.000.

Benarrousch, Jacques, to Sasson Jeans, Inc. Refillable soft tube for packaging liquid or paste products such as toothpaste, polish, shaving cream or the like. 4,445,609, Cl. 206-277.000.

Bend Research, Inc.: *See*—
Baker, Richard W.; and Ninomiya, Yasuo, 4,445,641, Cl. 239-6.000.

Bender, Audrey L., to Dynatech Laboratories Incorporated. Nontoxic aspirin composition. 4,446,132, Cl. 424-233.000.

Bender Machine Works, Inc.: *See*—
Schmid, Rolyn A., 4,445,522, Cl. 134-58.00R.

Bendix Corporation, The: *See*—
Van Siclen, Howard E., Jr., 4,445,490, Cl. 123-602.000.
Woodruff, Frank, 4,445,830, Cl. 418-22.000.

Benedetto, Enrico, to Oronzio de Nora S.A. Electrolytic purification and reconcentration of wash and rinse caustic solutions recovered from the regeneration of ion exchange resins. 4,445,987, Cl. 204-98.000.

Benedict, James J.: *See*—
Sunberg, Richard J.; and Benedict, James J., 4,446,052, Cl. 252-315.100.

Beneteau, Charles, to Patrick S.A. Plastic spike for sports shoe. 4,445,289, Cl. 36-134.000.

Benjamin, Gary H.: *See*—
Klose, Karl W.; and Benjamin, Gary H., 4,445,963, Cl. 156-420.000.

Benko, David A., to Goodyear Tire & Rubber Company, The. Ion beam deposition or etching re rubber-metal adhesion. 4,446,197, Cl. 428-625.000.

Bennett, Alan; and Brown, Derek, to British Gas Corporation. Device for detecting flooding of a hollow structure. 4,445,363, Cl. 73-40.50A.

Bennett, Terry A.; Eilenfeld, Herbert W.; and Lampman, Dewitt W., to PPG Industries, Inc. Tempering glass sheets by cooling comprising sublimation quenching. 4,445,921, Cl. 65-114.000.

Benton, Stephen A., to Polaroid Corporation. Holographic products and processes. 4,445,749, Cl. 350-376.000.

Berardi, Randal L.: *See*—
D'Augustine, Frank T.; and Berardi, Randal L., 4,445,874, Cl. 445-45.000.

Berde, Dennis W., to Grumman Aerospace Corporation. Apparatus and method for locating faults in cables. 4,446,421, Cl. 324-52.000.

Berg, Alan: *See*—
Grois, Igor; Margolin, Mark; and Berg, Alan, 4,445,750, Cl. 350-96.210.

Berg, Ellie; and Yowfoo, Joseph, to Fishman, Jeffrey. Educational board game. 4,445,867, Cl. 434-404.000.

Bergbreiter, Jack: *See*—
Kolling, Byron M.; Bergbreiter, Jack; and Hunn, Roy, 4,445,623, Cl. 220-343.000.

Bergthaller, Peter; and Strauss, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Photographic material comprising a layer with Ni complex of 2,2'-biaphenol. 4,446,219, Cl. 430-216.000.

Bernard, Claude: *See*—
Badoz, Janine; Bardin, Michelle; Bernard, Claude; Herlem, Michel; Robert, Guy; and Thiebault, Andre, 4,446,215, Cl. 429-190.000.

Bernauer, Otto; and Ziegler, Klaus, to Daimler-Benz Aktiengesellschaft. Storage material for hydrogen. 4,446,101, Cl. 420-424.000.

Bernhard, Herbert, to Seitz-Werke GmbH. Arrangement for a bottle handling machine. 4,445,549, Cl. 141-148.000.

Berninger, Mark S., to Life Technologies, Inc. Method for detection of a suspect viral deoxyribonucleic acid in an acellular biological fluid. 4,446,237, Cl. 436-504.000.

Berthod, Daniel P. M.; and Ferret, Simone, to Lever Brothers Company. Water-in-oil emulsions. 4,446,051, Cl. 252-309.000.

Bertrams, Josef: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

Bessler, Donald U., to Petrolite Corporation. Demulsification of surfactant-petroleum-water flood emulsions. 4,446,054, Cl. 252-344.000.

Betermier, Benedicte; Alvarez, Manuel; and Norris, Robert D., to FMC Corporation. Destruction of iron cyanide complexes. 4,446,029, Cl. 210-748.000.

Bethel, Leslie D.; Kerr, Howard A.; Strebendt, Frances B.; and Waninski, John E., Jr., to Bell Telephone Laboratories, Incorporated. Method for recording and updating stored messages in an announcement system. 4,446,336, Cl. 179-6.100.

Betz Laboratories, Inc.: *See*—
Becker, Larry W., 4,446,028, Cl. 210-697.000.
Becker, Larry W., 4,446,046, Cl. 252-181.000.
Snyder, William R.; and Feuerstein, Diane, 4,446,045, Cl. 252-180.000.

Beutier, Didier; Palvadeau, Claude; Pasquier, Gilles; and Dietrich, March, to Krebs & Cie S.A. Process and solvent for extraction of the chromates present in an aqueous solution. 4,446,026, Cl. 210-639.000.

Beverley, Ian: *See*—
Bardsley, Harold B.; and Beverley, Ian, 4,445,447, Cl. 112-79.00R.

Bibb, Albert E.: *See*—
Steeves, Arthur F.; and Bibb, Albert E., 4,445,988, Cl. 204-129.200.

Billig, Ernst: *See*—
Jamerson, Jackie D.; Billig, Ernst; and Bryant, David R., 4,446,074, Cl. 260-429.00R.

Bilofsky, Ruth C.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell; and Sahatjian, Ronald A., 4,446,305, Cl. 528-348.000.

Bilski, Gerard W., to Tri-Motion Industries, Inc. Bidirectional control valve. 4,445,538, Cl. 137-596.200.

Binder, Paul B.; and Di Napoli, Louis D., to General Signal Corporation. Multiple range capacitive pressure transducer. 4,445,383, Cl. 73-718.000.

Binsack, Rudolf; Lindner, Christian; Rempel, Dieter; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Ageing-resistant, processing-stable, high strength mixtures based on thermoplastic polyesters. 4,446,276, Cl. 525-64.000.

BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,445,884, Cl. 604-4.000.

Birkett, William B. Exposure indicator. 4,445,773, Cl. 355-68.000.

Bischkopf, Reiner: *See*—
Kronseder, Hermann; and Bischkopf, Reiner, 4,445,961, Cl. 156-364.000.

Bischoff, Gilbert: *See*—
Weiler, Rolf; Bischoff, Gilbert; and Schlag, Rudolf, 4,445,331, Cl. 60-547.100.

Bishop, Arthur E. Power steering valve. 4,445,422, Cl. 91-434.000.

Black & Decker Inc.: *See*—
Sanders, Anthony J., 4,445,811, Cl. 409-182.000.

Blank, Werner J.: *See*—
Cady, Susan M.; Blank, Werner J.; and Schirmann, Peter J., 4,446,280, Cl. 525-186.000.

Blassiau, Rene E.: *See*—
Arribas, Cecilio; and Blassiau, Rene E., 4,446,359, Cl. 219-485.000.

Blaszczak, Thaddeus E.: *See*—
Taleff, Alexander; Brady, Robert M.; and Blaszczak, Thaddeus E., 4,445,353, Cl. 72-136.000.

Bliley, Ward L., to Structural Fibers, Inc. Method for making lined vessels. 4,446,092, Cl. 264-258.000.

Bloch, Willi, to Volkswagenwerk Aktiengesellschaft. Safety device for vehicles. 4,445,648, Cl. 242-107.600.

Boccuti, A. David, to Polaroid Corporation. Encoded shutter blade apparatus. 4,445,762, Cl. 354-437.000.

Boden, Richard M; Vock, Manfred H.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Prenyl methyl carbonate and organoleptic uses thereof. 4,446,157, Cl. 426-3.000.

Bodicky, Raymond O., to Sherwood Medical Company. Infusion apparatus. 4,445,893, Cl. 604-165.000.

Boeckh, Franz-Xaver: *See*—
Hoffmeister, Jurgen; Ravasini, Guiseppe; and Boeckh, Franz-Xaver, 4,445,859, Cl. 433-79.000.

Boeing Company, The: *See*—
Engelke, Claude W.; Power, Royal A.; and Brees, Dale W., 4,445,652, Cl. 244-1.00R.

Bohanon, Hoy R., Sr., to Acme Engineering & Manufacturing Corporation. Slanted housing fan enclosure. 4,445,426, Cl. 98-116.000.

Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., to Firestone Tire & Rubber Company, The. Sealant compositions having, as an essential component, hydrogenated polybutadiene as network polymer. 4,445,562, Cl. 152-347.000.

Bohme, Rolf C.; and Lazerson, Max M., to General Mining Union Corporation Limited. Sorting system calibration. 4,445,615, Cl. 209-555.000.

Bohrn, Walter J.; and Sydorko, Peter J., to Armstrong World Industries, Inc. Particle ink application. 4,445,243, Cl. 8-151.000.

Bolgiano, Duane R., to International Mobile Machines Corporation. Rotary dial decoder. 4,446,339, Cl. 179-84.00R.

Boller, Thomas E.: *See—*
Malani, Narayandas; and Boller, Thomas E., 4,446,172, Cl. 427-160.000.

Bond, Curtis J.; and Ulm, John G. Quick-disconnect coupling and valve assembly. 4,445,551, Cl. 141-349.000.

Bond, Helen I. Hygienic article for blotting the rectal perineum region. 4,445,899, Cl. 604-385.000.

Bond, Hollis H., Jr.; and Franklin, Carl R., to United States of America, National Aeronautics & Space Administration. Digital interface for bi-directional communication between a computer and a peripheral device. 4,446,459, Cl. 340-825.210.

Bonham, Harry B., Jr., to Rockwell International Corporation. Automatic bonder for forming wire interconnections of automatically controlled configuration. 4,445,633, Cl. 228-102.000.

Bonnefoy, Jean, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Electrical connection device for high density contacts. 4,445,735, Cl. 339-17.00M.

Bopp, Warren G., to Eaton Corporation. Cooling means for torque converter bypass. 4,445,599, Cl. 192-3.290.

Borel, Pierre, to Jowa. Multisheet binder and assembly. 4,445,710, Cl. 281-45.000.

Borg, Catherine J.: *See—*
Borg, John L.; and Borg, Catherine J., 4,446,379, Cl. 290-55.000.

Borg, John L.; and Borg, Catherine J. Magnus effect power generator. 4,446,379, Cl. 290-55.000.

Borg-Warner Corporation: *See—*
Knight, Kerry G., 4,445,607, Cl. 192-107.00C.
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,446,203, Cl. 428-283.000.

Borris, Peter W.: *See—*
Freeman, Bob L.; and Borris, Peter W., 4,445,956, Cl. 156-154.000.

Borst, Arnoldus J., to Stichting Kennisexploitatie Nederland. Dental cavity measuring instrument. 4,445,857, Cl. 433-75.000.

Boser, Otmar H.; and Sweet, Richard C., to U.S. Philips Corporation. Metallurgical contacts in hermetically sealed glass encapsulated ceramic capacitors. 4,446,502, Cl. 361-308.000.

Bost, Alois. Three-point safety belt system. 4,445,709, Cl. 280-801.000.

Bostich, June M.: *See—*
Hsieh, Wen-Ching; Bostich, June M.; and Koepke, Jeffery W., 4,446,036, Cl. 252-8.55D.

Bottini, Alfred A.: *See—*
Powers, Joseph E.; Grimoldi, Ranaldo H.; Williamson, Calvin C.; and Bottini, Alfred A., 4,445,357, Cl. 72-399.000.

Bouille, Bernard, to Swiss Aluminium Ltd. Device for thermal treatment of scrap. 4,445,849, Cl. 432-128.000.

Boulanger, Henry J.; McGuirk, Andrew C.; and LaPlante, William J., to Texas Instruments Incorporated. Thermostat device having improved mounting means. 4,446,450, Cl. 337-380.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Thermostat device having improved mounting means. 4,446,451, Cl. 337-380.000.

Bouwhuis, Gijsbertus; and Braat, Josephus J. M., to U.S. Philips Corporation. Apparatus for the point-by-point scanning of an object. 4,446,548, Cl. 369-109.000.

Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., to Mobil Oil Corporation. Electronic system for release of on-bottom seismometer unit. 4,446,537, Cl. 367-15.000.

Bowen, Charlotte M. Absorbent pad holder. 4,445,242, Cl. 5-484.000.

Bowers, Clark A.: *See—*
Miller, Donald; and Bowers, Clark A., 4,445,719, Cl. 294-88.000.

Bowser, George H., to PPG Industries, Inc. Flexible non-extensible hinge for photomask assembly. 4,446,184, Cl. 428-57.000.

Boyle, Walter G. Board game involving international trade. 4,445,692, Cl. 273-256.000.

Braat, Josephus J. M.: *See—*
Bouwhuis, Gijsbertus; and Braat, Josephus J. M., 4,446,548, Cl. 369-109.000.

Brack, Alfred, to Bayer Aktiengesellschaft. Cationic naphtholactam dyestuffs. 4,446,326, Cl. 548-438.000.

Brady, Robert M.: *See—*
Taleff, Alexander; Brady, Robert M.; and Blaszczak, Thaddeus E., 4,445,353, Cl. 72-136.000.

Brajder, Antonio; and Kublick, Christian, to Siemens Aktiengesellschaft. Reliable signal system having at least one transmitter feeding plural series-connected receiver inputs. 4,446,550, Cl. 370-14.000.

Braksmayer, Diza P.; and Lovenguth, Ronald F., to FMC Corporation. Flame retardant polyphenylene ether-styrene thermoplastic resin compositions. 4,446,265, Cl. 524-139.000.

Brambilla, Guido, to Societa Impianti Elettrici Telefonici Telegrafici e Costruzioni Edili S.p.A. Two-tube telescopic hydraulic shock absorbers. 4,445,598, Cl. 188-322.160.

Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, to BASF Aktiengesellschaft. Thermoplastic molding material. 4,446,277, Cl. 525-68.000.

Brannon, Judeth H.: *See—*
Eberly, Paul E., Jr.; and Brannon, Judeth H., 4,446,005, Cl. 208-91.000.

Bratton, Daniel W. All weather clipboard. 4,445,728, Cl. 312-1.000.

Braun, Eugene R., to Eaton Corporation. Fluid actuated shift bar housing assembly. 4,445,393, Cl. 74-346.000.

Bray, Carl R.; and Cueni, Lee. Cotton candy accessory for blender. 4,445,832, Cl. 425-9.000.

Breckenridge, Gerald H. Spray boom mounting assembly. 4,445,657, Cl. 248-73.000.

Brede, Uwe; and Kordel, Gerhard, to Dynamit Nobel Aktiengesellschaft. Arrangement for the contactless transmission of electric energy to missiles during firing thereof. 4,445,434, Cl. 102-206.000.

Brees, Dale W.: *See—*
Engelke, Claude W.; Power, Royal A.; and Brees, Dale W., 4,445,652, Cl. 244-1.00R.

Breeze Illinois, Incorporated: *See—*
Bakker, Willem F., 4,445,743, Cl. 339-90.00R.

Breglia, Denis R.; and Oharek, Frank J., to United States of America, Navy. Head position and orientation sensor. 4,446,480, Cl. 358-104.000.

Bresler, Robert G., to McCormick Laboratories, Inc. Circuits for determining very accurately the position of a device inside biological tissue. 4,445,501, Cl. 128-1.500.

Bridgestone Tire Company Limited: *See—*
Kono, Mitsutsugu; and Inoue, Osamu, 4,445,561, Cl. 152-209.00B.

British Gas Corporation: *See—*
Bennett, Alan; and Brown, Derek, 4,445,363, Cl. 73-40.50A.
Burton, Stephen R.; Horley, Gary; and Hodrien, Ronald C., 4,446,003, Cl. 208-48.00Q.

British Nuclear Fuels Limited: *See—*
Critchley, Richard J.; and Swindells, Roy J., 4,446,063, Cl. 252-633.000.

Brixius, Darryl W.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Coatings formed from isocyanate-functional polymers containing a terminal monosulfide group. 4,446,175, Cl. 427-385.500.

Brochman, Wilfred R.; and Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Tamper-proof closure for container. 4,445,620, Cl. 220-271.000.

Brog, Roy A. Whey based imitation milk compositions. 4,446,164, Cl. 426-583.000.

Brogardh, Torgny; Ovren, Christer; and Sander, Lars, to ASEA Aktiebolag. Fiber optic measuring device with compensation for reflections in the fiber optic and with a possibility of simultaneous measurement of several quantities. 4,446,366, Cl. 250-227.000.

Broken Hill Proprietary Company Limited, The: *See—*
Salm, Dietmar F. E., 4,446,156, Cl. 428-648.000.

Brown, Boveri & Cie AG: *See—*
Steinleitner, Gunther, 4,446,213, Cl. 429-104.000.

Brown, Derek: *See—*
Bennett, Alan; and Brown, Derek, 4,445,363, Cl. 73-40.50A.

Brown, Harry J., to Union Carbide Corporation. Hard facing composition for iron base alloy substrate using VC, W, Mo, Mn, Ni and Cu and product. 4,446,196, Cl. 428-544.000.

Brown, Richard: *See—*
Whartenby, James C.; Brown, Richard; Rao, Srinivas T.; and Menna, Raymond J., 4,445,978, Cl. 204-15.000.

Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, to Texas Instruments Incorporated. Multiple register digital processor system with shared and independent input and output interface. 4,446,514, Cl. 364-200.000.

Brown, Samuel J., to Essex Group, Inc. Electromagnetic solenoid relay. 4,446,449, Cl. 335-131.000.

Browning, Andrea, to Thilmony, Evelyn, a part interest. Methd for preparing artistic works with yarn. 4,445,950, Cl. 156-63.000.

Browning, James T.; and Orlando, Franklin P., to FMC Corporation. Loose vine and cane eliminator. 4,445,316, Cl. 56-330.000.

Bruere, Alain E.: *See—*
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., 4,446,424, Cl. 324-62.000.

Bruhn, Peter H.; and Wustrau, Rolf, to International Business Machines Corporation. Method and apparatus for stacking rotor blanks on a shaft. 4,445,272, Cl. 29-598.000.

Bruning, E. Eugene, to Caterpillar Tractor Co. Bulkhead-fluid-line connector. 4,445,713, Cl. 285-14.000.

Bruning, Rolf; and Reimann, Klaus, to Heraeus Quarzschmelze GmbH. Apparatus for the surface cleaning of quartz-crystal pieces. 4,445,523, Cl. 134-65.000.

Brunswick Corporation: *See—*
Chmielewski, Cary J., 4,445,470, Cl. 123-196.00S.

Bryant, David R.: *See—*
Jamerson, Jackie D.; Billig, Ernst; and Bryant, David R., 4,446,074, Cl. 260-429.00R.

Bryant, Walter R., to Celanese Corporation. UV-Stabilization of oxymethylene copolymers. 4,446,263, Cl. 524-100.000.

Bucheler, Manfred; Klinksiek, Bernd; Gehringer, Hans; and Schnoring, Hildegard, to Bayer Aktiengesellschaft. Process for the preparation of pharmaceutical and cosmetic dispersions. 4,446,127, Cl. 424-59.000.

Buckingham, Robin E.: *See—*
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,446,113, Cl. 422-267.000.

Budecker, Ludwig, to ITT Industries, Inc. Radial piston machine. 4,445,825, Cl. 417-462.000.

Budzich, Mieczyslaw; and Fitz, Forest G., Jr., to Nassau Recycle Corporation. Guide tube. 4,445,355, Cl. 72-250.000.

Buford, J. Philip. Cooking grill heated from deep fat fryer. 4,445,428, Cl. 99-340.000.

Bukowski, John M.: *See—*
Kumar, Ashok; Segan, Ellen G.; Bukowski, John M.; and Helgeland, Jon L., 4,445,989, Cl. 204-147.000.

Bullen, Lee; and Hermach, Carl J., to Publishers Equipment Corporation. Method and apparatus for improving newspaper folding and cutting mechanisms. 4,445,881, Cl. 493-424.000.

Bunn, Stuart E.; and Owsley, Herbert B., to Ball Value Co., Inc. Valve for compressor clearance or by-pass control. 4,445,824, Cl. 417-440.000.

Buntemeyer, William R.: *See*—
Rawicz, Harris C.; Rizzo, Vincent J.; and Buntemeyer, William R., 4,446,409, Cl. 318-632.000.

Burgess, Mark E.: *See*—
Thorsby, Grover A.; and Burgess, Mark E., 4,445,643, Cl. 239-197.000.

Burndy Corporation: *See*—
Nager, Urs F., Jr., 4,446,330, Cl. 174-51.000.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,445,909, Cl. 44-72.000.

Burns, William K., to United States of America, Navy. Fiber optic rotation-sensing gyroscope with (3×2) coupler. 4,445,780, Cl. 356-350.000.

Burochkin, Alexandr E.: *See*—
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Burton, Stephen R.; Horley, Gary; and Hodrien, Ronald C., to British Gas Corporation. Heat recovery process and apparatus. 4,446,003, Cl. 208-48.00Q.

Buss, David L. Method of manufacture for metal trough. 4,445,260, Cl. 29-157.00R.

Buyan, Frank M.; and Haddad, James H., to Mobil Oil Corporation. Improved FCC vessel and cyclone apparatus. 4,446,107, Cl. 422-107.000.

Buzzi, Carlo. Balancing machine for bodies of rotation. 4,445,372, Cl. 73-459.000.

Byer, Joseph I. Roll retaining means for a dispensing box. 4,445,645, Cl. 242-55.530.

Byrd, Audis C.; Todd, Bradley L.; and Pattison, William W., Jr., to Halliburton Company. Sludge lance advancing apparatus. 4,445,465, Cl. 122-392.000.

Bystedt, Hjalmar S. I., to Sunds Defibrator AB. Method and device for the manufacture of mechanical pulp. 4,445,973, Cl. 162-261.000.

C.I.E.F. -Compagnia Immobiliare e Finanziaria S.p.A.: *See*—
Pernici, Ermanno, 4,446,190, Cl. 428-156.000.

Cable Technology Laboratories, Inc.: *See*—
Katz, Carlos; and Zidon, Amicam C., 4,446,095, Cl. 264-558.000.

Cabrera, Pedro P., to Coulter Electronics, Inc. Liquid metering and transfer valve assembly. 4,445,391, Cl. 73-864.120.

Cady, Susan M.; Blank, Werner J.; and Schirmann, Peter J., to American Cyanamid Company. Crosslinking composition containing activated carboxylic ester polymer and amine-terminated triazine resin. 4,446,280, Cl. 525-186.000.

Caillet, Eugene, to Goodyear Tire & Rubber Company, The. Highway railway crossing and cap therefor. 4,445,643, Cl. 238-8.000.

Cain, George R., to Koppers Company, Inc. Apparatus for sensing empty hoppers. 4,445,628, Cl. 222-66.000.

Cairns, Frank D. Game apparatus. 4,445,690, Cl. 273-118.00R.

Calabrese, Donald P.; Kerns, Matthew T.; and Quinn, Dennis M. Post accident analysis. 4,446,097, Cl. 376-256.000.

Calculagraph Company: *See*—
Fryer, Warren R., 4,446,340, Cl. 179-175.30R.

Caldicott, Jack R., to Mangood Corporation. System for loading railroad cars. 4,445,581, Cl. 177-163.000.

Caldwell, George R.; and Gallagher, Edward J., to General Signal Corporation. Method of sealing interfaces of bearing surfaces to steel barrels of piston pumps. 4,445,258, Cl. 29-156.70R.

California Institute of Technology: *See*—
Williams, Arthur R.; and Johnson, William L., 4,446,568, Cl. 378-3.000.

Callihan, Patrick R.: *See*—
Farr, Garth M.; and Callihan, Patrick R., 4,445,402, Cl. 81-57.160.

Camco Inc.: *See*—
Cannon, Trever E., 4,445,455, Cl. 116-216.000.

Candelaria, Jon; and Heidinger, Kurt S., to Motorola, Inc. Dual layer passivation. 4,446,194, Cl. 428-428.000.

Cannon, James R.: *See*—
Labour, Donald; Cannon, James R.; and Klugman, Alfred, 4,445,505, Cl. 128-80.00C.

Cannon, Trever E., to Camco Inc. Dial adjustment and calibration of oven control devices. 4,445,455, Cl. 116-216.000.

Canon Kabushiki Kaisha: *See*—
Aoki, Takao; and Inoue, Takahiro, 4,445,772, Cl. 355-3.0CH.
Matsumura, Susumu, 4,445,764, Cl. 354-480.000.
Takasu, Yoshio; and Ishikawa, Shozo, 4,446,217, Cl. 430-58.000.
Yamamoto, Hiroshi, 4,445,765, Cl. 354-478.000.

Canzoneri, Anthony S., to Process Development, Inc. Ultrasonic streaming current detector. 4,446,435, Cl. 324-453.000.

Cappelli, Nicholas P.: *See*—
Steffen, Cliff; and Cappelli, Nicholas P., 4,445,626, Cl. 222-39.000.

Cappelli, Romano, to USS Engineers and Consultants, Inc. Procedure for rebuilding the movable plate in the pouring valve of a ladle. 4,445,262, Cl. 29-402.080.

Carbonaro, Antonio; Ferrero, Cesare; and Corbellini, Margherita, to Agip Petroli S.p.A. Polymerizing and copolymerizing olefinically unsaturated compounds and means therefor. 4,446,289, Cl. 526-142.000.

Cardieri, Edward J. Batting tee. 4,445,685, Cl. 273-26.00R.

Carey, C. H.: *See*—
Thompson, Gary J.; and Carey, C. H., 4,445,351, Cl. 72-43.000.

Carl Zeiss-Stiftung: *See*—
Wollnik, Hermann; Haas, Rudiger; and Kassen, Folkert, 4,445,516, Cl. 128-736.000.

Carlisle Corporation: *See*—
Schauffele, Roy F., 4,445,306, Cl. 52-410.000.

Carlson, Robert J.; and Youngner, Daniel W., to Honeywell Inc. Method of plasma etching of films containing chromium. 4,445,966, Cl. 156-643.000.

Carnegie-Mellon University: *See*—
Milnes, Arthur G., 4,445,965, Cl. 156-624.000.

Carre, Jean-Jacques; and Levral, Roland, to Societe Anonyme DBA. Method of preforming a booster casing element with its reinforcement. 4,445,263, Cl. 29-445.000.

Carrier Corporation: *See*—
Gray, Kenneth P., 4,445,366, Cl. 73-64.200.

Carswell, William R.: *See*—
Friedman, Evelyn; and Carswell, William R., 4,445,625, Cl. 221-241.000.

Carter, Thomas P., Jr.: *See*—
Ying, Lincoln; and Carter, Thomas P., Jr., 4,446,255, Cl. 523-205.000.

Cartesse, Georges, to Societe Generale pour l'Industrie Electronique (S.O.G.I.E.). Electrical connectors for coaxial and two-wire cables. 4,445,745, Cl. 339-177.00R.

Cartner, Jack O. Mower head with moveable guard. 4,445,312, Cl. 56-15.500.

Casals-Stenzel, Jorge: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,446,147, Cl. 424-274.000.

Casamatta, Angelo, to Honeywell Information Systems Inc. Microprogrammed control unit with multiple branch capability. 4,446,518, Cl. 364-200.000.

Casper, James R.; and Hauer, Harvey J., to Syngas Company. Waste heat boiler. 4,445,463, Cl. 122-7.00R.

Cassidy, Benjamin J., to International Paper Company. Protective shipping and display carton. 4,445,613, Cl. 206-418.000.

Castle, Peter M.; Sweeney, George G.; and Yannopoulos, Lymperios N., to Westinghouse Electric Corp. Method for making silicon carbide coatings. 4,446,169, Cl. 427-53.100.

Caterpillar Tractor Co.: *See*—
Bruning, E. Eugene, 4,445,713, Cl. 285-14.000.
Thies, Jerome A.; and Tietje, Mark E., 4,445,332, Cl. 60-455.000.

Cauwet, Daniele: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,445,521, Cl. 132-7.000.

Cavender, Donald E., to Monarch Marking Systems, Inc. Record assembly. 4,446,182, Cl. 428-40.000.

Celanese Corporation: *See*—
Bryant, Walter R., 4,446,263, Cl. 524-100.000.
Hicks, Darrell D., 4,446,256, Cl. 523-402.000.
Ying, Lincoln; and Carter, Thomas P., Jr., 4,446,255, Cl. 523-205.000.

Cerwick, Joel A., to Armco Inc. Waste treatment system having integral intrachannel clarifier. 4,446,018, Cl. 210-195.400.

Ceskoslovenska akademie ved: *See*—
Wichterle, Otto, 4,445,362, Cl. 73-37.500.

Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, to Crutcher, William C. Electronic time setting for a quartz analog watch. 4,445,785, Cl. 368-187.000.

Chamness, Addison B., Jr. Engine fuel system. 4,445,485, Cl. 123-546.000.

Champeau, Marcel; and Tabutin, Andre, to Ramo S.A. Lathes with central headstock. 4,445,405, Cl. 82-2.500.

Chana, Howard E., to General Motors Corporation. Gear synchronizer for a power transmission. 4,445,602, Cl. 192-53.00F.

Chang, Chieh; and Lee, Man S., to GTE Automatic Electric Incorporated. Switched capacitor n-path filter. 4,446,438, Cl. 328-127.000.

Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., to PPG Industries, Inc. Moisture curable compositions containing reaction products of hydrophobic polyols and monomer organosilicon-containing substances. 4,446,292, Cl. 528-29.000.

Chant, Bernard J.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Walker, Bruce K.; Desai, Mukund; and Gai, Eliezer, 4,445,421, Cl. 91-186.000.

Chartered Industries Of Singapore Private Limited: *See*—
Sullivan, Leroy J.; and Waterfield, Robert L., 4,445,418, Cl. 89-33.00D.

Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., to Office National d'Etudes et de Recherches Aerospatiales. Surface resistivimeter. 4,446,424, Cl. 324-62.000.

Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., to Vsesojuzny Kardiologichesky Nauchny Tsentr. Dextran derivative of fibrinolysin. 4,446,316, Cl. 536-112.000.

Chemplex Company: *See*—
Hoff, Raymond E., 4,446,288, Cl. 526-129.000.

Chen, Nai Y.; Rankel, Lillian A.; and Rudnick, Leslie R., to Mobil Oil Corporation. Process for upgrading vacuum resids to premium liquid products. 4,446,004, Cl. 208-57.000.

Cheng, Bo-Ching; Rosenbaum, Herman S.; and Armijo, Joseph S., to General Electric Company. Method for forming nuclear fuel containers of a composite construction and the product thereof. 4,445,942, Cl. 148-6.300.

Cheng, Kang: *See—*
Larner, Joseph; Cheng, Kang; and Galasko, Gail, 4,446,064, Cl. 260-112.00R.

Cheng, Paul J., to Phillips Petroleum Company. Carbon black manufacture. 4,446,108, Cl. 422-156.000.

Chernyshev, Ivan S.: *See—*
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Cherry Electrical Products Corporation: *See—*
Cherry, Walter L., 4,446,400, Cl. 313-517.000.

Cherry, Walter L., to Cherry Electrical Products Corporation. Gaseous display panel with webbed anode. 4,446,400, Cl. 313-517.000.

Chester, Arthur W.; and Murray, James G., to Mobil Oil Corporation. Catalysts for olefin polymerization comprising the reaction product of organotitanium and organochromium with zeolites. 4,446,243, Cl. 502-62.000.

Chevron Research Company: *See—*
Nicksic, Stephen W., 4,446,118, Cl. 423-226.000.
Van Nordstrand, Robert A., 4,446,244, Cl. 502-84.000.

Chiaramonte, Vincent; and Barkow, Alice, to Mont-Cler Appliances Inc. Precision pontic and method for making it. 4,445,862, Cl. 433-191.000.

Chiotti, Premo: *See—*
Schmidt, Frederick A.; Rehbein, David; and Chiotti, Premo, 4,446,120, Cl. 423-350.000.

Chiu, Chen-Hwa, to Air Products and Chemicals, Inc. Process for liquefied natural gas. 4,445,917, Cl. 62-25.000.

Chmielewski, Cary J., to Brunswick Corporation. Oil injection warning system. 4,445,470, Cl. 123-196.00S.

Chu, Shaw C.; and Spencer, Arthur T., to Mobil Oil Corporation. Aqueous coating comprising dispersible epoxy resin-acid polymer ester and diluent polymer, and method of preparation. 4,446,258, Cl. 523-406.000.

Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, to Research Corporation. Purified human prostate antigen. 4,446,122, Cl. 424-1.100.

Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., to Tapco Products Company, Inc. Combined portable sheet bending brake and coil holder. 4,445,356, Cl. 72-319.000.

Chubb & Son's Lock and Safe Company: *See—*
Nuttall, Brian; and Laxson, Charles F., 4,445,718, Cl. 292-341.170.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,446,239, Cl. 436-532.000.

Ciba-Geigy AG: *See—*
Long, William E., 4,446,227, Cl. 430-513.000.
Schaetzer, Harry; Raisin, Helmut; Mausezahl, Dieter; and Ciba-Geigy AG, 4,445,905, Cl. 8-641.000.

Ciba-Geigy Corporation: *See—*
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,446,128, Cl. 424-88.000.

Cicognani, Mario, to Industrie Pirelli, S.p.A. Toothed belt. 4,445,879, Cl. 474-205.000.

Cillieres, Jaques. Lead line between at least two persons, particularly for cross country skiing or ski touring. 4,445,866, Cl. 434-253.000.

Cinderey, Michael B.: *See—*
Rose, John B.; and Cinderey, Michael B., 4,446,294, Cl. 528-128.000.

Cisar, James R.; and Grauzer, Attila, to U.C. Industries. Foam extrusion die and monitoring apparatus. 4,445,837, Cl. 425-141.000.

Clark, Ray, to Applied Power Inc. Shock absorber and air spring assembly. 4,445,673, Cl. 267-64.240.

Clatworthy, Edward F.: *See—*
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,445,943, Cl. 148-12.300.
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,445,944, Cl. 148-12.300.

Claus, Richard O.; and Zerwekh, Paul S., to United States of America, National Aeronautics and Space Administration. Ultrasonic transducer with Gaussian radial pressure distribution. 4,446,396, Cl. 310-334.000.

Clayton, Donald H., Jr. Shock absorber for an oil well pumping unit. 4,445,674, Cl. 267-141.000.

Cleaver, Laird C.: *See—*
Baron, Walter J.; and Cleaver, Laird C., 4,445,540, Cl. 137-625.430.

Clemens, Donald L.: *See—*
Jordan, William D.; Hinshaw, Howard G.; and Clemens, Donald L., 4,446,504, Cl. 361-386.000.

Clenet, Daniel, to La Telemecanique Electrique. DC/AC Bridge inverter including a switching aid and inductive energy recovery circuit. 4,446,513, Cl. 363-132.000.

Cliffside Pipelayers: *See—*
Hansen, Bent J.; and Thompson, Clifford F., 4,445,677, Cl. 269-41.000.

Close, Donald, to David Hudson, Inc. Fluoroelastomer film compositions containing phenoxy resins and method for the preparation thereof. 4,446,176, Cl. 427-386.000.

Clyde, Robert A. Apparatus for a photochemical reaction. 4,446,236, Cl. 435-287.000.

Cobb, Harold W., to Delphax Systems. Corona charging apparatus. 4,446,371, Cl. 250-324.000.

Coca-Cola Company, The: *See—*
Credle, William S., 4,445,539, Cl. 137-614.030.

Cofer, Frank H., to Audichron Company, The. Method and apparatus for revertive automatic intercept message delivery in a telephone system. 4,446,337, Cl. 179-18.00B.

Cohen, Jerome M.: *See—*
Pindar, John F.; and Cohen, Jerome M., 4,446,039, Cl. 252-52.00R.

Cohen, Yehuda: *See—*
Assaf, Gad; and Cohen, Yehuda, 4,446,025, Cl. 210-602.000.

Cohnen, Erich; and Armah, Ben, to Beiersdorf Aktiengesellschaft. Substituted oxadiazoles and thiadiazoles, and methods of preparation and use thereof. 4,446,142, Cl. 424-269.000.

Cole, William E.; O'Connell, Drew P.; and Griffith, James L., to Thermo Electron Corporation. In situ rapid wash apparatus and method. 4,445,919, Cl. 65-27.000.

Coleman, Cecil A., to Balfour Lumber Company. Water fog-type ash precipitator for a kilned lumber pile breakdown hoist. 4,445,559, Cl. 144-363.000.

Coleman, John D.; Obst, Donald L.; and Kraft, Heinrich A., to Siecor Corporation. Flat type feeder cable. 4,445,593, Cl. 187-1.00R.

Coleman, John R., to General Motors Corporation. Valve assembly. 4,445,333, Cl. 60-578.000.

Coletti, Onorio J., to Ford Motor Company. Distributor with reduced radio frequency interference. 4,445,493, Cl. 123-633.000.

Collignon, Roger, to Socapex. End fitting for optical fibre connector and connector equipped with such an end fitting. 4,445,753, Cl. 350-96.210.

Colvin, David P.: *See—*
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,445,502, Cl. 128-25.00R.

Combs, C. Marlon: *See—*
Lee, Charles E.; and Combs, C. Marlon, 4,446,335, Cl. 179-2.00C.

Combustion Engineering, Inc.: *See—*
Mastronarde, Thomas P., 4,445,462, Cl. 122-7.00R.
Matthews, Francis T., 4,445,844, Cl. 431-170.000.
Pollock, William H., 4,445,442, Cl. 110-171.000.
Tanca, Michael C., 4,445,441, Cl. 110-165.00R.

Comerford, Matthias F.; and McCallan, Michael G., to Cooper Industries, Inc. Preheater for use in mass soldering apparatus. 4,446,358, Cl. 219-388.000.

Commissariat a l'Energie Atomique: *See—*
Nguyen-Thanh, Thong, 4,445,568, Cl. 165-81.000.
Valette, Serge, 4,445,759, Cl. 350-96.120.

Compagnie Generale des Etablissements Michelin: *See—*
Musy, Jacques, 4,445,560, Cl. 152-200.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Bonnefoy, Jean, 4,445,735, Cl. 339-17.00M.

Compere, Alicia L.; Googin, John M.; and Griffith, William L., to United States of America, Energy. Extracting alcohols from aqueous solutions. 4,445,908, Cl. 44-56.000.

Computervision Corporation: *See—*
Friedman, David; and Mandel, Philip, 4,446,412, Cl. 318-696.000.

Concannon, Michael P.; and Erdelyi, Charles K., to International Business Machines. Reference voltage generating circuit. 4,446,383, Cl. 307-297.000.

Concord, Inc.: *See—*
Gust, Jacob N., 4,445,314, Cl. 56-126.000.

Connell, John C.; and Serber, Stephen L., to Honeywell Inc. Hydronic antitrust operating system. 4,445,638, Cl. 237-8.00R.

Connell, Talbert D., to Crutcher Resources Corporation. Center tracking welder unit with floating reference. 4,446,353, Cl. 219-125.120.

Connolly, George C., Jr., to United States of America, Navy. Small diameter, low frequency multimode hydrophone. 4,446,544, Cl. 367-155.000.

Conoco Inc.: *See—*
Gergely, John S., 4,446,370, Cl. 250-301.000.
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,446,434, Cl. 324-363.000.

Consolidated Cable and Rigging, Inc.: *See—*
Wilson, Richard C., 4,445,669, Cl. 254-369.000.

Container Technologies, Inc.: *See—*
Davis, John C.; Reiss, Ronald J.; and Rica, Albert F., 4,445,550, Cl. 141-329.000.

Cook, Donald. Monitoring and control system. 4,446,458, Cl. 340-825.060.

Cook, Inc.: *See—*
Gianturco, Cesare, 4,445,896, Cl. 604-238.000.

Cooney, David A.: *See—*
Marquez, Victor E.; Cooney, David A.; Gebeyehu, Gulilat; and Jayaram, Hiremagalur N., 4,446,315, Cl. 536-27.000.

Cooper Industries, Inc.: *See—*
Comerford, Matthias F.; and McCallan, Michael G., 4,446,358, Cl. 219-388.000.

Cooper, John R.: *See—*
Cowdery, David; and Cooper, John R., 4,445,511, Cl. 128-419.00P.

Cooper Tire & Rubber Company: *See—*
Klose, Karl W.; and Benjamin, Gary H., 4,445,963, Cl. 156-420.000.

Copeland Corporation: *See—*
King, Robert W., 4,445,534, Cl. 137-512.300.

Coppus Engineering Corporation: *See—*
Pratap, Prem, 4,445,392, Cl. 74-3.000.

Copyer Kabushiki Kaisha: *See—*
Takasu, Yoshio; and Ishikawa, Shozo, 4,446,217, Cl. 430-58.000.

Corban International, Ltd.: *See*—
Thomas, David C., 4,446,519, Cl. 364-300.000.

Corbellini, Margherita: *See*—
Carbonaro, Antonio; Ferrero, Cesare; and Corbellini, Margherita, 4,446,289, Cl. 526-142.000.

Corbett, Reg D. Diffusers. 4,445,852, Cl. 432-260.000.

Corning Glass Works: *See*—
Ford, Clarence E., Jr.; and Johnson, Ronald E., 4,445,432, Cl. 101-152.000.

Cosby, Chris; and Heath, Martin, to Delco Products Overseas Corporation. Resilient metal contact brush. 4,445,746, Cl. 339-252.00R.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,446,208, Cl. 428-407.000.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Synergistic antioxidant mixtures. 4,446,264, Cl. 524-109.000.

Couch, Robert D.: *See*—
Emery, Franklin T.; Lenderking, Bruce N.; and Couch, Robert D., 4,446,426, Cl. 324-158.0MG.

Coulter Electronics, Inc.: *See*—
Cabrera, Pedro P., 4,445,391, Cl. 73-864.120.

Coupek, Jiri: *See*—
Filka, Karel; Coupek, Jiri; and Kocourek, Jan, 4,446,275, Cl. 525-54.100.

Cowan, William S., to Armco Inc. Diverless subsea template levelling system and method. 4,445,807, Cl. 405-227.000.

Cowdery, David; and Cooper, John R., to Telectronics Pty. Ltd. Pacer electrode connector assembly. 4,445,511, Cl. 128-419.00P.

Cowles, Christopher S., to Shell Oil Company. Rotational geophone. 4,446,541, Cl. 367-75.000.

Crain, George F. Wood burning heater providing improved uniform temperature output. 4,445,496, Cl. 126-61.000.

Crain, Graydon H. Sheet piling or mooring cell. 4,445,806, Cl. 405-216.000.

Crane, Julius, to Metalfab, Inc. Reciprocating tamper for a concrete mold press. 4,445,839, Cl. 425-421.000.

Crane Packing Limited: *See*—
Wilkinson, Samuel C., 4,445,695, Cl. 277-65.000.

Cray, Donald L. Vehicle servicing lift. 4,445,665, Cl. 254-88.000.

Credle, William S., to Coca-Cola Company, The. Dip tube and valve with quick-disconnect coupling for a collapsible container. 4,445,539, Cl. 137-614.030.

Cringle, David C.: *See*—
DuPart, Michael S.; Oakes, Billy D.; and Cringle, David C., 4,446,119, Cl. 423-228.000.

Critchley, Richard J.; and Swindells, Roy J., to British Nuclear Fuels Limited. Disposal of radioactive waste. 4,446,063, Cl. 252-633.000.

Cross, Jimmie R. Speaker cabinet. 4,445,730, Cl. 312-214.000.

Crowley, John I.: *See*—
Afzali-Ardakani, Ali; Crowley, John I.; and Wu, Anthony W., 4,446,193, Cl. 428-422.000.

Crutcher Resources Corporation: *See*—
Connell, Talbert D., 4,446,353, Cl. 219-125.120.

Crutcher, William C.: *See*—
Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, 4,445,785, Cl. 368-187.000.

Cseko, Christine: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,446,032, Cl. 252-8.600.

Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A.: *See*—
Modone, Eros; and Roba, Giacomo, 4,445,918, Cl. 65-3.120.

Cueni, Lee: *See*—
Bray, Carl R.; and Cueni, Lee, 4,445,832, Cl. 425-9.000.

Cuisenaire Company of America, Inc.: *See*—
Sellon, Jeffrey, 4,445,865, Cl. 434-207.000.

Cullinane, Daniel, Jr., to Lynn Products Company, Incorporated. Oxygen sensor and method for making same. 4,446,000, Cl. 204-415.000.

Cunningham, Robert A., to Hughes Tool Company. Telemetry drill pipe with pressure sensitive contacts. 4,445,734, Cl. 339-16.00C.

Cunningham, Walter F. Color-coded numeric or alphabetic filing system. 4,445,711, Cl. 283-1.00R.

Cuomo, Jerome J.; Harper, James M. E.; and Kaufman, Harold R., to International Business Machines Corporation. Compact plug connectable ion source. 4,446,403, Cl. 315-111.810.

Currie, Thomas P.; and Goldberg, Norman, to Sperry Corporation. Multichip thin film module. 4,446,477, Cl. 357-74.000.

Cutter Laboratories, Inc.: *See*—
Jordan, Robert E., 4,446,126, Cl. 424-183.000.
Jordan, Robert E., 4,446,314, Cl. 536-21.000.

Czyzewski, Ted S.; and Greenwell, Bartley A., to Groen Division - Dover Corporation. Apparatus for chilling and plasticizing fatty materials. 4,445,429, Cl. 99-455.000.

D. L. Auld Company, The: *See*—
Waugh, Robert E., 4,446,179, Cl. 428-31.000.

Dack, Glen W. D.: *See*—
Yataki, Masamichi; Dack, Glen W. D.; and Ertl, Paul S., 4,445,649, Cl. 242-118.200.

Dai Nippon Insatsu K.K.: *See*—
Sato, Yoshihiro, 4,445,634, Cl. 229-40.000.

Dai Nippon Printing Co., Ltd.: *See*—
Takiguchi, Ryohei; and Nagashima, Masayoshi, 4,446,467, Cl. 346-76.0PH.

Daido Tokushuko Kabushiki Kaisha: *See*—
Saito, Tetsuya; and Mori, Hiroshi, 4,445,933, Cl. 75-59.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bernauer, Otto; and Ziegler, Klaus, 4,446,101, Cl. 420-424.000.
Filsinger, Reinhard, 4,445,603, Cl. 192-0.055.
Geiss, Sieghart, 4,445,440, Cl. 105-215.00R.
Voneky, Geza; and Schussler, Hans H., 4,445,276, Cl. 33-168.00R.

Daines, John, to Mobil Oil Corporation. Method and mold for making an improved egg carton. 4,446,088, Cl. 264-155.000.

Dalrymple, Monte J., to Zilog, Inc. Circuit and technique for initializing the state of bistable elements in an integrated electronic circuit. 4,446,381, Cl. 307-200.00B.

Dana Corporation: *See*—
Schmiel, Herbert H., 4,445,541, Cl. 137-636.200.

Dancsi, Lajos: *See*—
Szantay, Csaba; Szbao, Lajos; Kalsus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, 4,446,139, Cl. 424-256.000.

D'Andrade, Bruce M.; Ng, Ping F.; and Ma, Tak M., to ARCO Industries Ltd. Toy motorcycle with lighting mechanism. 4,445,297, Cl. 46-230.000.

Daniels, Larry C.; and Whittaker, Gary S., to Eastman Kodak Company. Metallurgical coating system. 4,446,200, Cl. 428-661.000.

Daniels, Ronald M. Automobile headlight control system. 4,446,507, Cl. 362-20.000.

Darasko, Edward. Coaster and swivel assembly therefor. 4,445,699, Cl. 280-87.04R.

Data General Corporation: *See*—
Alexander, Michael C., 4,446,457, Cl. 340-745.000.

Daugherty, James C. Tennis teaching device. 4,445,686, Cl. 273-29.00A.

Daugherty, Yvonne B. Decorative bar soap holder. 4,446,178, Cl. 428-26.000.

D'Augustine, Frank T.; and Berardi, Randal L., to RCA Corporation. Apparatus and method for aligning the envelope and electron gun mount assembly of a CRT. 4,445,874, Cl. 445-45.000.

Dauser, William C., Jr., to Heneveld, Lloyd A., Trustee of Dauser Trust IV— Solderless Connector. Wire connector. 4,446,332, Cl. 174-87.000.

David Hudson, Inc.: *See*—
Close, Donald, 4,446,176, Cl. 427-386.000.

Davis, John C.; Reiss, Ronald J.; and Rica, Albert F., to FranRica Mfg. Inc.; and Container Technologies, Inc. Flexible walled container having membrane fitment for use with aseptic filling apparatus. 4,445,550, Cl. 141-329.000.

Davis, Lewis B., Jr.; and Dibelius, Norman R., to General Electric Co. Wingtip vortex flame stabilizer for gas turbine combustor flame holder. 4,445,339, Cl. 60-749.000.

Davy McKee Aktienegesellschaft: *See*—
Koschinek, Gunter; Wandel, Dietmar; Kretschmann, Bernd; and Zinsser, Rolf, 4,446,299, Cl. 528-272.000.

Dawson, C. Bruce, to O'Sullivan Corporation. Integrated process for preparing a continuous string of molded articles wound in a coil. 4,445,836, Cl. 425-135.000.

Dayco Corporation: *See*—
Hollaway, Gerald C., Jr., 4,445,949, Cl. 156-62.200.

De La Moneda, Francisco H.; and Dockerty, Robert C., to International Business Machines Corporation. MOSFET Structure and process to form micrometer long source/drain spacing. 4,445,267, Cl. 29-571.000.

Dean, Charles. Building roof structure. 4,445,302, Cl. 52-90.000.

Deeg, Reinhard; Galaske, Folker; and Kettenbach, Helmuth, to International Standard Electric Corporation. Supply roll holding arrangement. 4,445,647, Cl. 242-68.400.

Deel, Gary G. Grounding ring for shielded cable. 4,445,733, Cl. 339-14.00R.

Deere & Company: *See*—
Schneider, Werner, 4,445,586, Cl. 180-132.000.

Deering, Roland F.; and Duir, John H., to Union Oil Company of California. Recovery of retorted shale from an oil shale retorting process. 4,446,001, Cl. 208-11.00R.

DeFrees, Joseph H., to Allegheny Valve Company. Air check valve assembly for powdered bulk product transport. 4,445,533, Cl. 137-512.100.

Degussa Aktiengesellschaft: *See*—
Schmitz, Werner; and Simon, Edgar, 4,445,809, Cl. 406-152.000.

Dehlen, Bengt L. A., to Trelleborg AB. Wear-resistant rubber product and a method of making same. 4,446,192, Cl. 428-339.000.

del Castillo-Olivares, Fernando. Patch pocket-forming, folding and setting apparatus. 4,445,631, Cl. 223-1.000.

Delco Products Overseas Corporation: *See*—
Cosby, Chris; and Heath, Martin, 4,445,746, Cl. 339-252.00R.

Delhaes, Johannes C., to Rubber-en Kunststoffabriek ENBI B.V. Conveyor shaft provided with rubber rollers, and method and apparatus for making same. 4,445,257, Cl. 29-117.000.

Deline, Gordon R.: *See*—
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,446,537, Cl. 367-15.000.

Delphax Systems: *See*—
Cobb, Harold W., 4,446,371, Cl. 250-324.000.

Del Valle, Frank: *See*—
Friedman, Herman H.; Del Valle, Frank; and Hofmann, Lisa A., 4,446,161, Cl. 426-335.000.

De Mey, Jan R.; and Moeremans, Marc K. J. J., to Janssen Pharmaceutica N.V. Bright field light microscopic method of localizing tissue antigens. 4,446,238, Cl. 436-527.000.

Dempsey, John C.: *See*—
Stieff, Lorin R.; and Dempsey, John C., 4,445,364, Cl. 73-40.700.

Den Hartog, Arie P., to Shell Oil Company. Apparatus for contacting fluid with particulate solid material. 4,446,112, Cl. 422-216.000.

Denholm, A. Stuart; Frutiger, William A.; and Williams, Kenneth E., to Sony Corporation. Process and apparatus for converged fine line electron beam treatment objects. 4,446,373, Cl. 250-492.200.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Okazaki, Haruo; and Ohkubo, Takashi, 4,446,274, Cl. 524-812.000.
Derrick, Dennis P., to General Motors Corporation. Quick take-up master cylinder. 4,445,334, Cl. 60-585.000.
Desai, Mukund: *See*—
Walker, Bruce K.; Desai, Mukund; and Gai, Eliezer, 4,445,421, Cl. 91-186.000.
Desbois, Michel, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of α,α-difluoroalkyl-thiophenyl ketones. 4,446,078, Cl. 260-465.00F.
Design Applications Incorporated: *See*—
Shofu, Koichi, 4,445,611, Cl. 206-369.000.
DeTrano, Mario: *See*—
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,445,562, Cl. 152-347.000.
Deuster, Dieter: *See*—
Bassier, Friedr.; Adrian, Fritz; and Deuster, Dieter, 4,445,937, Cl. 106-109.000.
Deutsches Krebsforschungszentrum: *See*—
Hammerling, Gunter; Muller, Ingo; and Menger, Erich, 4,446,104, Cl. 422-63.000.
Devault, Michel; Quinquis, Jean-Paul; and Rouaud, Yvon. Time division multiplex switching network for multiservice digital networks. 4,446,555, Cl. 370-94.000.
Dewitte, Jean; and Aymard, Pierre, to Saint-Gobain Industries. Spherical balls and their manufacture. 4,446,207, Cl. 428-402.000.
Deymann, Detlef: *See*—
Hobes, John; Payer, Wolfgang; and Deymann, Detlef, 4,446,311, Cl. 528-493.000.
Dhillon, Major S., to American Hoechst Corporation. Sulfur and/or amide-containing exposure accelerators for light-sensitive coatings with diazonium compounds. 4,446,218, Cl. 430-175.000.
Diamond Shamrock Corporation: *See*—
Hinden, Jean M., 4,446,245, Cl. 502-101.000.
Dibelius, Norman R.: *See*—
Davis, Lewis B., Jr.; and Dibelius, Norman R., 4,445,339, Cl. 60-749.000.
Dick, George W., to Bell Telephone Laboratories, Incorporated. Planar AC plasma display having glow suppressor electrode. 4,446,402, Cl. 313-586.000.
Dietrich, Felix M.: *See*—
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,446,128, Cl. 424-88.000.
Dietrich, March: *See*—
Beutier, Didier; Palvadeau, Claude; Pasquier, Gilles; and Dietrich, March, 4,446,026, Cl. 210-639.000.
Dijkmans, Eise C.: *See*—
van de Plassche, Rudy J.; Dijkmans, Eise C.; and Schouwenaars, Hendrikus J., 4,446,419, Cl. 323-316.000.
Dilks, Charles H., Jr.; and Yau, Wallace W. Sedimentation field flow fractionation channel and method. 4,446,014, Cl. 209-155.000.
Di Napoli, Louis D.: *See*—
Binder, Paul B.; and Di Napoli, Louis D., 4,445,383, Cl. 73-718.000.
Dinsmore, Stanley R.; and Mrochek, John E., to United States of America, Energy. System for analyzing coal liquefaction products. 4,446,105, Cl. 422-70.000.
Director-General of Agency of Industrial Science and Technology: *See*—
Ohsawa, Kazuya; Shibata, Toshiaki; and Takahashi, Kenichi, 4,445,755, Cl. 350-96.340.
DiResta, Gene R. Apparatus for performing tissue perfusion measurements. 4,445,515, Cl. 128-632.000.
Disco Co., Ltd.: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,445,300, Cl. 51-283.00R.
Divens, William C.; and Vaerewyck, Eugene G., to Westinghouse Electric Corp. Metal coated, tapered, optical fiber coupled to substrate and method of fabrication. 4,445,751, Cl. 350-96.140.
Divisek, Jiri; and Schmitz, Heinz, to Kernforschungsanlage Julich GmbH. Electrolyzer for alkaline water electrolysis. 4,445,994, Cl. 204-258.000.
Dix, Peter; Pogany, George A.; and Sangha, Parminder, to Shell Oil Company. Polyether polyol process. 4,446,313, Cl. 536-18.600.
Dixon, Byron P. Resilient marker. 4,445,803, Cl. 404-10.000.
Dockerty, Robert C.: *See*—
De La Moneda, Francisco H.; and Dockerty, Robert C., 4,445,267, Cl. 29-571.000.
Dodane, Raymond, to Montres Dodane-Precia-Gete. System for the control of a wheel for driving in rotation a chronograph hand. 4,445,783, Cl. 368-105.000.
Doerfler, Frederick B., to Horix Manufacturing Company. Container filling machine product dispensing cylinder. 4,445,629, Cl. 222-148.000.
Doi Hiroaki: *See*—
Miyadera, Yasuo; Fujioka, Atsushi; Kumazawa, Tetsuo; and Doi Hiroaki, 4,446,191, Cl. 428-245.000.
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, to Mitsubishi Petrochemical Company Limited. Crosslinkable polyethylene resin composition. 4,446,283, Cl. 525-344.000.
Dokiya, Masayuki: *See*—
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, 4,445,934, Cl. 75-68.00A.
Donaldson Company, Inc.: *See*—
Robinson, Harold L., 4,446,019, Cl. 210-223.000.
Donovan, Joseph A., to Harris Corporation. Low windload circularly polarized antenna. 4,446,465, Cl. 343-797.000.
Dove, Georges: *See*—
Giddey, Claude; and Dove, Georges, 4,446,166, Cl. 426-631.000.
Dow Chemical Company, The: *See*—
Beale, Alvin F., Jr., 4,446,252, Cl. 521-28.000.
DuPart, Michael S.; Oakes, Billy D.; and Cringle, David C., 4,446,119, Cl. 423-228.000.
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,446,273, Cl. 524-556.000.
Lee, John M.; and Bauman, William C., 4,446,201, Cl. 428-696.000.
McIntyre, James A.; and Phillips, Robert F., 4,445,986, Cl. 204-98.000.
Dowden, Paul J.: *See*—
Evans, David A.; and Dowden, Paul J., 4,445,608, Cl. 198-509.000.
Drake, Charles A., to Phillips Petroleum Company. Polymer residue treatment. 4,446,308, Cl. 528-481.000.
Drake, Evelyn N.; and Tsao, Yuh-hwang, to Exxon Research and Engineering Co.; and Exxon Production Research Company. Method of using a spacer for well control fluid. 4,445,576, Cl. 166-291.000.
Dreishev, Igor I.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.
Dresser Industries, Inc.: *See*—
Kisiel, Stanley C., III, 4,445,714, Cl. 285-23.000.
Koenn, Lawrence D.; and Drude, David B., 4,446,368, Cl. 250-262.000.
DRG (UK) Limited: *See*—
Evans, David A.; and Dowden, Paul J., 4,445,608, Cl. 198-509.000.
Drisko, Benjamin B. Full torque transmission control. 4,445,329, Cl. 60-431.000.
Drouet, Michel G., to Hydro Quebec. Method and device for detecting and locating fault and/or partial discharges in a gas-insulated electrical equipment. 4,446,420, Cl. 324-52.000.
Drude, David B.: *See*—
Koenn, Lawrence D.; and Drude, David B., 4,446,368, Cl. 250-262.000.
Dryan-Fordahl Technologies S.A.: *See*—
Huguenin, Raymond; and Kuechli, Gottfried, 4,445,256, Cl. 29-25.350.
Duarte-Martins, Hermino, Jr.: *See*—
Johansson, Kjell; and Duarte-Martins, Hermino, Jr., 4,445,506, Cl. 128-84.00R.
Dubief, Claude: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,445,521, Cl. 132-7.000.
Dubrow, David. Drawing assembly. 4,445,275, Cl. 33-30.00R.
Dufay, Jean-Francois: *See*—
Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, 4,445,785, Cl. 368-187.000.
Duijkers, Peter A., to U.S. Philips Corporation. Circuit arrangement for deriving a field synchronizing signal from an incoming signal. 4,446,483, Cl. 358-154.000.
Duir, John H.: *See*—
Deering, Roland F.; and Duir, John H., 4,446,001, Cl. 208-11.00R.
Dunn, Anthony G.: *See*—
Beales, Keith J.; Partington, Sally; and Dunn, Anthony G., 4,445,754, Cl. 350-96.340.
DuPart, Michael S.; Oakes, Billy D.; and Cringle, David C., to Dow Chemical Company, The. Method and compositions for reducing corrosion in the removal of acidic gases from gaseous mixtures. 4,446,119, Cl. 423-228.000.
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Auditore-Hargreaves, Karen; and Miesowicz, Frederick M., 4,446,233, Cl. 435-7.000.
Baker, Richard A.; Forsythe, George D.; Likhyani, Kewal K.; Roberts, Robert E.; and Robertson, David C., 4,446,024, Cl. 210-500.200.
Brixius, Darryl W.; and Simms, John A., 4,446,175, Cl. 427-385.500.
Eustice, Albert L., 4,446,059, Cl. 252-514.000.
Huang, Hua-Feng; and Wallace, Walter A., 4,446,348, Cl. 219-10.55A.
Kirkland, Joseph J., 4,446,015, Cl. 209-155.000.
Neidich, Douglas A., 4,445,747, Cl. 339-256.00R.
O'Brien, William G., 4,445,458, Cl. 118-401.000.
Proskow, Stephen, 4,446,220, Cl. 430-286.000.
Rutkiewic, Andrew F.; and White, James P., 4,446,044, Cl. 252-170.000.
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,446,269, Cl. 524-316.000.
Vasta, Joseph A., 4,446,259, Cl. 523-408.000.
Waller, Francis J., 4,446,329, Cl. 585-458.000.
Dupont, S. T.: *See*—
Royer, Michel E., 4,445,982, Cl. 204-18.100.
Dworsky, Lawrence N.; and Kennedy, Garth R., to Motorola Inc. Method for determining surface contour of piezoelectric wafers. 4,446,432, Cl. 324-71.500.
Dynametric, Inc.: *See*—
Lee, Charles E.; and Combs, C. Marlon, 4,446,335, Cl. 179-2.00C.

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Brede, Uwe; and Kordel, Gerhard, 4,445,434, Cl. 102-206.000.
Weingerber, Greger; and Steffen, Klaus-Dieter, 4,446,327, Cl. 549-307.000.
Dynatech Laboratories Incorporated: *See*—
Bender, Audrey L., 4,446,132, Cl. 424-233.000.
Dyren, Karl E. A.: *See*—
Malmstrom, Per-Ove; and Dyren, Karl E. A., 4,445,814, Cl. 414-295.000.
Dyrna, Peter: *See*—
Sepp, Gunther; and Dyrna, Peter, 4,446,558, Cl. 372-64 000.
E. R. Squibb & Sons, Inc.: *See*—
Varna, Ravi K., 4,446,071, Cl. 260-397.300.
Earsley, Melvin L. Molding of seal rings. 4,446,085, Cl. 264-108.000.
Easley, Robert E. License plate frame with detachable display panels. 4,445,291, Cl. 40-210.000.
East-West Precision, Inc.: *See*—
Margolin, Mark; and Margolin, David, 4,445,632, Cl. 225-2.000.
Eastman Kodak Company: *See*—
Belote, Stephen N.; Leonard, Don R.; and Luce, Garrett C., 4,446,301, Cl. 528-295.300.
Daniels, Larry C.; and Whittaker, Gary S., 4,446,200, Cl. 428-661.000.
Kurtz, Clark N., 4,446,479, Cl. 358-75.000.
Moore, Louis D.; Rule, Mark; and Wicker, Thomas H., 4,446,303, Cl. 528-308.200.
Powell, Philip G., 4,446,484, Cl. 358-166.000.
Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., 4,446,302, Cl. 528-302.000.
Wadsworth, Donald H.; Thomas, Harold T.; Fletcher, George L.; and Weidner, Charles H., 4,446,223, Cl. 430-338.000.
Eaton Corporation: *See*—
Baltare, Gunnar, 4,445,597, Cl. 188-206.00A.
Bopp, Warren G., 4,445,599, Cl. 192-3.290.
Braun, Eugene R., 4,445,393, Cl. 74-346.000.
Jaeschke, Ralph L., 4,446,392, Cl. 310-105.000.
Leimbach, Richard C., 4,445,527, Cl. 137-226.000.
Link, Donald A.; and Swessel, John A., Jr., 4,446,503, Cl. 361-346.000.
Mazur, Joseph S., 4,445,583, Cl. 180-68.100.
Sheiry, William G., 4,446,345, Cl. 200-85.00R.
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Eberly, Paul E., Jr.; and Brannon, Judeth H., to Exxon Research and Engineering Co. Guard bed for the removal of sulfur and nickel from feeds previously contacted with nickel containing sulfur adsorption catalysts. 4,446,005, Cl. 208-91.000.
Ebermann, Joachim; Graf, Heinz; Schleicher, Siegfried; and Uhlig, Jurgen, to Veb Werkzeugmaschinenkombinat "7 Oktober" Berlin. Control circuit for machine tools. 4,446,408, Cl. 318-600.000.
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Gowing, James R., 4,445,294, Cl. 43-42.470.
Echte, Adolf: *See*—
Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, 4,446,277, Cl. 525-68.000.
Economics Laboratory, Inc.: *See*—
Lappi, Susan C.; and Maloney, James E., 4,445,971, Cl. 162-158.000.
Edamatsu, Kunihiko; and Makabe, Takayoshi, to Fuji Electric Co., Ltd. Automatic product inspection system. 4,446,481, Cl. 358-106.000.
Eden, Jamal S., to B. F. Goodrich Company, The. Copper catalyst compositions for fluid-bed oxyhydrochlorination of ethylene. 4,446,249, Cl. 502-225.000.
Edwards, Hugh T., Jr.: *See*—
O'Cheskey, Theodore H.; and Edwards, Hugh T., Jr., 4,446,352, Cl. 219-121.0LC.
Eenboom, Algund; and Muller, Edzard, to Fried. Krupp GmbH. Method for the registration and evaluation of dental findings as well as an apparatus for the implementation of the method. 4,446,453, Cl. 340-286.00M.
Egar, William P.: *See*—
Galle, Edward L.; Hyldon, Roy G.; and Egar, William P., 4,446,163, Cl. 426-448.000.
Eggli, Daniele; von Ow, Dieter; and Huni, Gregor, to Leuenberger, Hans. Method of applying an areal flexible electrode to a spot of the body covered by a plastic cast as well as a device for executing this method. 4,445,518, Cl. 128-783.000.
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha. Arc-suppressing apparatus for circuit breaker. 4,446,347, Cl. 200-144.00R.
Eheim, Franz, to Robert Bosch GmbH. RPM Governor of a fuel injection pump. 4,445,476, Cl. 123-387.000.
Eibe, Werner W., to White Consolidated Industries, Inc. Variable crown roll shape control systems. 4,445,349, Cl. 72-17.000.
Eiglmeier, Kurt; and Knieps, Reinhard, to Riedel-de Haen AG. Substituted bromofluorobenzene derivatives and process for its manufacture. 4,446,075, Cl. 260-465.00G.
Eilenfeld, Herbert W.: *See*—
Bennett, Terry A.; Eilenfeld, Herbert W.; and Lampman, Dewitt W., 4,445,921, Cl. 65-114.000.
Eisai Co., Ltd.: *See*—
Sawada, Tohru, 4,446,129, Cl. 424-94.000.
Eisenberg, Joel H. Glove with thumb restraint element. 4,445,507, Cl. 128-133.000.
Ekbladh, Fred V. G.; and Tillander, Hans. Catheter for postsurgical drainage. 4,445,897, Cl. 604-280.000.
Ekbom, Ragnar, to Stal-Laval Turbin AB. Method of manufacturing bladed elements for rotary fluid machines. 4,445,259, Cl. 29-156.80B.
Eklund, Nils O., to Nordiskafilt AB. Sheet assembly and method of manufacturing same. 4,446,187, Cl. 428-136.000.
Electric Power Rsearch Institute, Inc.: *See*—
Friedmann, Paul G.; Patris, Frank N.; and Tomalesky, Allan W., 4,446,562, Cl. 373-149.000.
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Badoz, Janine; Bardin, Michelle; Bernard, Claude; Herlem, Michel; Robert, Guy; and Thiebault, Andre, 4,446,215, Cl. 429-190.000.
Electroplating Engineers of Japan, Limited: *See*—
Yamamoto, Kenji, 4,445,992, Cl. 204-203.000.
Elliott, Thomas; and Knecht, Todd. Hay cutting machines. 4,445,313, Cl. 56-16.400.
Elliott, William O., to McConway & Torley Corporation. Striker for a railway coupler. 4,445,617, Cl. 213-60.000.
Emery, Franklin T.; Lenderking, Bruce N.; and Couch, Robert D., to Westinghouse Electric Corp. On-line RF arc monitor for large rotating generators. 4,446,426, Cl. 324-158.0MG.
Emmel, Henry J., to Bausch & Lomb Incorporated. Mechanism for accomplishing coarse and fine adjustments in a microscope. 4,445,758, Cl. 350-530.000.
Ender, Ottmar: *See*—
Ender, Sigrid; and Ender, Ottmar, 4,445,241, Cl. 5-468.000.
Ender, Sigrid; and Ender, Ottmar. Cover for pillows, mattresses and the like. 4,445,241, Cl. 5-468.000.
Endo, Hiroshi; Hirate, Naoyuki; and Tezuka, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of recovering tantalum from silicon-containing tantalum scrap. 4,446,115, Cl. 423-63.000.
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Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,445,491, Cl. 123-605.000.
Endo, Teruyuki, to International Telephone & Telegraph Corporation. Static pressure sensor with glass bonded strain gauge transducers. 4,445,385, Cl. 73-726.000.
Endo, Yoshihiro; Kawaguchi, Masashi; Mizukami, Etsuo; and Kishishita, Hiroshi, to Sharp Kabushiki Kaisha. Structure of thin electroluminescent display panel sealed by glass substrates. 4,446,399, Cl. 313-505.000.
Energy Conversion Devices, Inc.: *See*—
Yu, Terry T., 4,446,224, Cl. 430-346.000.
Engeler, William E.: *See*—
Baertsch, Richard D.; and Engeler, William E., 4,446,532, Cl. 364-824.000.
Engelhard Corporation: *See*—
Bartholic, David B., 4,446,009, Cl. 208-113.000.
Engelke, Claude W.; Power, Royal A.; and Brees, Dale W., to Boeing Company, The. Adjustable rocket thrust alignment device. 4,445,652, Cl. 244-1.00R.
Engineered Products Company: *See*—
Nelson, Joseph N., 4,445,456, Cl. 116-268.000.
English, Philip H.; and Szpak, Anthony D. Apparatus for making individual beverage quantities. 4,446,158, Cl. 426-79.000.
Enomoto, Shigeo; Hirobe, Hitoshi; and Urata, Shinji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zooming device. 4,445,757, Cl. 350-429.000.
Entrup, Hubert G., to Jean Walterscheid GmbH. Adjustable friction overload clutch. 4,445,876, Cl. 464-48.000.
Environmental Elements Corp.: *See*—
Simmers, Kathleen W., 4,446,027, Cl. 210-661.000.
EnviroStrand, Inc.: *See*—
Molenaar, Maarten; and Schreuder, Hermann A., 4,446,086, Cl. 264-118.000.
Erdelyi, Charles K.: *See*—
Concannon, Michael P.; and Erdelyi, Charles K., 4,446,383, Cl. 307-297.000.
Eremeev, Vadim V.; and Guloian, Jury A., to Gusevsky Fulual Gosudarstvennogo Nauchno-Issledovatelskogo Insitut Stekla. Method of heat polishing pattern cut glassware. 4,445,922, Cl. 65-120.000.
Ermanski, Albert G.: *See*—
Wright, David M.; and Ermanski, Albert G., 4,445,799, Cl. 402-4.000.
Ertl, Paul S.: *See*—
Yataki, Masamichi; Dack, Glen W. D.; and Ertl, Paul S., 4,445,649, Cl. 242-118.200.
Erwien, Helmut: *See*—
Linke, Horst; Albers, Josef; and Erwien, Helmut, 4,445,878, Cl. 474-92.000.
Esashi, Masayoshi: *See*—
Mizusaki, Takashi; Matsuo, Tadayuki; Esashi, Masayoshi; and Abe, Hiroshi, 4,446,474, Cl. 357-25.000.
Escher Wyss GmbH: *See*—
Kurtz, Rudiger, 4,445,975, Cl. 162-336.000.
Eskinazi, Victoria; and Wells, James E., to Air Products and Chemicals, Inc. Morpholine compounds prepared via phosphate catalysts. 4,446,320, Cl. 544-106.000.
Espedal, Michael L., to Texaco Inc. Burner for combusting oxygen-coal mixture. 4,445,444, Cl. 110-261.000.
Essex Group, Inc.: *See*—
Brown, Samuel J., 4,446,449, Cl. 335-131.000.
Eustice, Albert L., to Du Pont de Nemours, E. I., and Company. Conductor compositions. 4,446,059, Cl. 252-514.000.
Evans, David A.; and Dowden, Paul J., to DRG (UK) Limited. Bucket wheels and bucket wheel reclaimers. 4,445,608, Cl. 198-509.000.

Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, to Beecham Group p.l.c. Benzopyrans. 4,446,113, Cl. 422-267.000.
Evans, Richard F., to Kenmar Export Ltd. Collet. 4,445,697, Cl. 279-1.00A.
Evans, William R., to AMP Incorporated. Mass termination of densely grouped conductors. 4,445,748, Cl. 339-94.00M.
Exxon Production Research Co.: *See—*
Abdallah, Mohamed G.; and McDonald, William M., 4,445,804, Cl. 405-173.000.
Drake, Evelyn N.; and Tsao, Yuh-hwang, 4,445,576, Cl. 166-291.000.
Exxon Research and Engineering Co.: *See—*
Drake, Evelyn N.; and Tsao, Yuh-hwang, 4,445,576, Cl. 166-291.000.
Eberly, Paul E., Jr.; and Brannon, Judeth H., 4,446,005, Cl. 208-91.000.
Lundberg, Robert D.; and Thaler, Warren A., 4,446,267, Cl. 524-211.000.
Siegmund, Charles W., 4,446,002, Cl. 208-23.000.
Wheelock, Kenneth S.; and Schucker, Robert C., 4,446,011, Cl. 208-121.000.
F. L. Smidth & Co.: *See—*
Lind, Leif, 4,445,911, Cl. 55-2.000.
Faber, Johannes W.; and Weick, Gunter, to U.S. Philips Corporation. Optical fiber switch with rotary gear movement. 4,445,752, Cl. 350-96.200.
Fabian, Roger C.: *See—*
Reynolds, Frederick W., III; Miranda, Robert E.; and Fabian, Roger C., 4,445,952, Cl. 156-94.000.
Facet Enterprises, Inc.: *See—*
Waters, Paul E.; Vaughan, David S.; and Mustico, Carmen J., Jr., 4,445,596, Cl. 188-171.000.
Facey, Eugene R.: *See—*
Ray, Donald R.; and Facey, Eugene R., 4,445,805, Cl. 405-203.000.
FAG Kugelfischer Georg Schafer & Co.: *See—*
Oppl, Gunter; and Schmitt, Gunther, 4,445,320, Cl. 57-88.000.
Fairchild Camera & Instrument Corporation: *See—*
Pendleton, Joan, 4,446,473, Cl. 357-24.000.
Farnia, Khosrow, to Allis-Chalmers Corporation. Waste heat recovery method and apparatus. 4,445,461, Cl. 122-7.00R.
Farr, Garth M.; and Callihan, Patrick R., to Farr Oil Tool, Inc. Power tong and back-up tong assembly. 4,445,402, Cl. 81-57.160.
Farr Oil Tool, Inc.: *See—*
Farr, Garth M.; and Callihan, Patrick R., 4,445,402, Cl. 81-57.160.
Faulkner, Richard D.; Thoman, Daniel L.; and McDonie, Arthur F., to RCA Corporation. Photomultiplier tube having improved count-rate stability. 4,446,401, Cl. 313-533.000.
Fayter, Richard G., Jr.; and Hall, Allen L., to National Distillers and Chemical Corporation. Substituted-cyclopropyl sulfones. 4,446,077, Cl. 260-465.00K.
Fedotov, Mikhail T.: *See—*
Ivanov, Andrei S.; Komorin, Leonid V.; Nikishkin, Vladimir I.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,446,374, Cl. 250-492.300.
Fehrle, Martin: *See—*
Rieder, Werner; and Fehrle, Martin, 4,446,195, Cl. 428-458.000.
Feild, James R. Suction dissector. 4,445,517, Cl. 128-752.000.
Felder, Gregory F., to B. F. Goodrich Company, The. Tire building drum. 4,445,962, Cl. 156-398.000.
Feldman, Salomon: *See—*
Krupka, Yaakov; Feldman, Salomon; and Yerushalmi, Shmuel, 4,445,512, Cl. 128-419.0PT.
Feller, Johannes: *See—*
Aufderhaar, Erhard; Feller, Johannes; Hultsch, Gunther; and Kislinger, Walter, 4,446,021, Cl. 210-378.000.
Ferag AG: *See—*
Reist, Walter, 4,445,681, Cl. 271-300.000.
Ferrero, Cesare: *See—*
Carbonaro, Antonio; Ferrero, Cesare; and Corbellini, Margherita, 4,446,289, Cl. 526-142.000.
Ferret, Simone: *See—*
Berthod, Daniel P. M.; and Ferret, Simone, 4,446,051, Cl. 252-309.000.
Ferrofluidics Corporation: *See—*
Raj, Kuldip; Moskowitz, Ronald; and Rodier, Raymond, 4,445,696, Cl. 277-80.000.
Ferron, Rene . Support for garbage bags. 4,445,658, Cl. 248-99.000.
Fester, Walter; and Huber, Bernd, to Hoechst Aktiengesellschaft. Set polyacrylonitrile filaments and fibers, and a process for their production. 4,446,206, Cl. 428-364.000.
Feuerstein, Diane: *See—*
Snyder, William R.; and Feuerstein, Diane, 4,446,045, Cl. 252-180.000.
FIAB System AB: *See—*
Niklasson, Tage, 4,445,960, Cl. 156-344.000.
Fiedler, Armin, to International Freezer Corp. Pressure operated switch including an expandable flat tube. 4,446,344, Cl. 200-83.00B.
Field, Martin J.: *See—*
Stoltman, Donald D.; Kabasin, Daniel F.; and Field, Martin J., 4,445,369, Cl. 73-204.000.
Figgie International Inc.: *See—*
Puccinelli, Joseph S.; and Lukezich, Paul J., 4,445,307, Cl. 52-638.000.
Figueroa, Luis, to Hughes Aircraft Company. Mode-locked semiconductor laser with tunable external cavity. 4,446,557, Cl. 372-45.000.
Figura, Ilona W.: *See—*
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,446,103, Cl. 422-37.000.
Filka, Karel; Coupek, Jiri; and Kocourek, Jan, to Prirodovedecka fakulta University Karlovy. Sorbent for saccharides, glycoproteins and polyesters comprising a lectin covalently bonded with a vehicle and method for preparation thereof. 4,446,275, Cl. 525-54.100.
Filsinger, Reinhard, to Daimler-Benz Aktiengesellschaft. Safety circuit for an electronic throttle control of internal combustion engines. 4,445,603, Cl. 192-0.055.
Finckh, Hermann: *See—*
Tratz, Herbert; Finckh, Hermann; and Kunstle, Konrad, 4,445,325, Cl. 60-39.182.
Fineberg, Douglas H.; and Haynes, Andrew, to Baker International Corporation. Unrestricted bore safety joint. 4,445,572, Cl. 166-188.000.
Finegold, Hyman B., to Globe Tool & Engineering Company, The. Dynamoelectric field assembly and winding therefor. 4,446,393, Cl. 310-184.000.
Finley, Joseph H.: *See—*
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,446,062, Cl. 252-609.000.
Fiquet, Claire: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,445,521, Cl. 132-7.000.
Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,445,562, Cl. 152-347.000.
Fischer, Pierre, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Ammunition container, especially drum magazine. 4,445,419, Cl. 89-33.00D.
Fischer & Porter Company: *See—*
Herzl, Peter J.; and Strohmeier, Warren O., 4,445,388, Cl. 73-861.240.
Fisher, Oscar. Apparatus for processing film discs. 4,445,769, Cl. 354-322.000.
Fishman, Jeffrey: *See—*
Berg, Ellie; and Yowfoo, Joseph, 4,445,867, Cl. 434-404.000.
Fitz, Forest G., Jr.: *See—*
Budzich, Mieczyslaw; and Fitz, Forest G., Jr., 4,445,355, Cl. 72-250.000.
Flaherty, Robert, to Westinghouse Electric Corp. All-metal expandable ultra high vacuum seal. 4,445,694, Cl. 277-1.000.
Flasza, Michael D.: *See—*
Johnson, Fred D.; Flasza, Michael D.; and Tzakis, George J., 4,446,443, Cl. 330-257.000.
Fletcher, George L.: *See—*
Wadsworth, Donald H.; Thomas, Harold T.; Fletcher, George L.; and Weidner, Charles H., 4,446,223, Cl. 430-338.000.
Fletcher, Roy W., to Union Special Corporation. Apparatus for delivering disk-like objects to an attaching station. 4,445,448, Cl. 112-110.000.
Flex-Kleen Corporation: *See—*
Robinson, James W., 4,445,915, Cl. 55-378.000.
Floby Durk: *See—*
Ihrman, Carl-Bertil, 4,445,590, Cl. 182-222.000.
FMC Corporation: *See—*
Betermier, Benedicte; Alvarez, Manuel; and Norris, Robert D., 4,446,029, Cl. 210-748.000.
Braksmayer, Diza P.; and Lovenguth, Ronald F., 4,446,265, Cl. 524-139.000.
Browning, James T.; and Orlando, Franklin P., 4,445,316, Cl. 56-330.000.
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,446,062, Cl. 252-609.000.
Fockler, William: *See—*
LeGrand, Jesse S.; Fockler, William; and Jezo, Mairice L. J., 4,446,464, Cl. 343-399.000.
Fodor, Ferenc: *See—*
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.
Fong, Hiram L., Jr.: *See—*
Morgan, Albert E., Jr., 4,445,453, Cl. 114-290.000.
Ford, Clarence E., Jr.; and Johnson, Ronald E., to Corning Glass Works. Article decorating. 4,445,432, Cl. 101-152.000.
Ford Motor Company: *See—*
Coletti, Onorio J., 4,445,493, Cl. 123-633.000.
Malani, Narayandas; and Boller, Thomas E., 4,446,172, Cl. 427-160.000.
McNamara, David A., 4,446,447, Cl. 331-42.000.
Forman, Philip: *See—*
Love, Michael; and Forman, Philip, 4,445,877, Cl. 474-255.000.
Forsythe, George D.: *See—*
Baker, Richard A.; Forsythe, George D.; Likhyani, Kewal K.; Roberts, Robert E.; and Robertson, David C., 4,446,024, Cl. 210-500.200.
Fort, Robert G.: *See—*
Post, Richard L.; and Fort, Robert G., 4,445,970, Cl. 162-135.000.
Fortmann, William E., to United Technologies Corporation. Temperature regulation of air cycle refrigeration systems. 4,445,815, Cl. 415-12.000.
Foster, Stephen R.; and Austin, Peter W., to Baker Cac, Inc. Actuator having Belleville washer configuration operating in concert with a piston cylinder member. 4,445,424, Cl. 92-5.00R.

Foster Wheeler Energy Corporation: *See*—
Stewart, Robert D.; and Taylor, Thomas E., 4,445,443, Cl. 110-245.000.

Fountaine, Harvey A., to Sterling Drug Inc. Chewable antacid tablets. 4,446,135, Cl. 424-154.000.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,445,521, Cl. 132-7.000.

Fouss, James L.; and Parker, John J., to Hancor, Inc. Arch end cap. 4,445,542, Cl. 138-94.000.

Fowlx, William R., to Rockwell International Corporation. Programmable frequency synthesizer primarily for use in an atomic clock. 4,446,446, Cl. 331-3.000.

Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul. Wound dressing comprising silver sulfadiazine incorporated in animal tissue. 4,446,124, Cl. 424-27.000.

Fox, David A.; and Tipton, Lynn L., to Westinghouse Electric Corp. Voltage regulator for aircraft generators. 4,446,417, Cl. 322-25.000.

Fox, Paul: *See*—
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, 4,446,124, Cl. 424-27.000.

Frager, Jean: *See*—
Gabor, Gabriel, 4,446,560, Cl. 373-25.000.

Framatome: *See*—
Schwind, Jacques; and Le Feuvre, Camille, 4,446,099, Cl. 376-277.000.

Francel, Josef; Stewart, Daniel R.; and Horn, Uriah, to Owens-Illinois, Inc. Lead-free and cadmium-free glass frit compositions for glazing, enameling and decorating. 4,446,241, Cl. 501-14.000.

Franke, George, to Simplex Time Recorder Co. Single piece trigger and knock off mechanism. 4,446,468, Cl. 346-82.000.

Franke, Kurt, to Siemens Aktiengesellschaft. X-Ray diagnostic generator for an X-ray tube comprising several focal spots. 4,446,569, Cl. 378-115.000.

Franklin, Carl R.: *See*—
Bond, Hollis H., Jr.; and Franklin, Carl R., 4,446,459, Cl. 340-825.210.

FranRica Mfg. Inc.: *See*—
Davis, John C.; Reiss, Ronald J.; and Rica, Albert F., 4,445,550, Cl. 141-329.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Hansmann, Johann, 4,445,438, Cl. 104-12.000.

Freed, Meier E.; and Abou-Gharbia, Magid, to American Home Products Corporation. Tetra- and hexa-hydropyrrolo(1,2-a)quinoxaline and azaquinoxaline derivatives. 4,446,323, Cl. 544-344.000.

Freeman, Bob L.; and Borris, Peter W., to Hexcel Corporation. Method and material for securing structure for machining. 4,445,956, Cl. 156-154.000.

French, Kenneth A.: *See*—
Hanyzewski, Eugene F.; French, Kenneth A.; and Walker, Thomas S., 4,445,553, Cl. 144-145.00A.

Fried. Krupp GmbH: *See*—
Eenboom, Algund; and Muller, Edzard, 4,446,453, Cl. 340-286.00M.

Friedman, David; and Mandel, Philip, to Computervision Corporation. Method and apparatus for controlling stepper motors. 4,446,412, Cl. 318-696.000.

Friedman, Evelyn; and Carswell, William R. Vending machine having access blocking members. 4,445,625, Cl. 221-241.000.

Friedman, Herman H.; Del Valle, Frank; and Hofmann, Lisa A., to General Foods Corporation. Aromatic, monohydric alcohols as preservatives for foods. 4,446,161, Cl. 426-335.000.

Friedmann, Paul G.; Patris, Frank N.; and Tomalesky, Allan W., to Electric Power Rsearch Institute, Inc. Method and apparatus for measuring crucible level of molten metal. 4,446,562, Cl. 373-149.000.

Frillici, Fernando V.; and Infantino, Joseph R., to AMF Incorporated. Bowling pin having an ionomer resin cladding. 4,445,688, Cl. 273-82.00R.

Froncisz, Wojciech; and Hyde, James S., to Medical College of Wisconsin. Microwave resonator. 4,446,429, Cl. 324-316.000.

Fror, Werner. Sport shoe with a studded sole. 4,445,288, Cl. 36-134.000.

Frost, John W., to Jax Products Inc. Portable stove with gimbal mounting. 4,445,495, Cl. 126-24.000.

Frutiger, William A.: *See*—
Denholm, A. Stuart; Frutiger, William A.; and Williams, Kenneth E., 4,446,373, Cl. 250-492.200.

Fryer, Warren R., to Calculagraph Company. Customer premises loop test unit powered from the normal central office power source. 4,446,340, Cl. 179-175.30R.

Fuji Photo Film Company, Ltd.: *See*—
Maekawa, Masakazu; Nakamura, Sukenori; Sugiyama, Masatoshi; and Odawara, Hideo, 4,446,174, Cl. 427-261.000.

Fuji Electric Co., Ltd.: *See*—
Edamatsu, Kunihiko; and Makabe, Takayoshi, 4,446,481, Cl. 358-106.000.
Hayashi, Shizuo, 4,445,670, Cl. 266-80.000.

Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 4,445,293, Cl. 43-24.000.

Fuji Photo Film Co., Ltd.: *See*—
Horikawa, Kazuo, 4,446,487, Cl. 358-280.000.
Iwakura, Ken; and Sugiyama, Takekatsu, 4,446,209, Cl. 428-411.000.
Kishimoto, Shinzo; and Yamamuro, Kiyohiko, 4,446,225, Cl. 430-393.000.
Mizuno, Chiaki; Tamai, Yasuo; and Tsuji, Nobuo, 4,446,205, Cl. 428-327.000.
Nakauchi, Kenji, 4,445,778, Cl. 356-222.000.
Sugiyama, Masatoshi; Yoshida, Kazutaka; and Ogawa, Akira, 4,446,470, Cl. 346-140.00R.

Fuji Xerox Co., Ltd.: *See*—
Itoh, Satoru, 4,446,486, Cl. 358-280.000.
Uchida, Hiroyasu, 4,445,682, Cl. 271-301.000.

Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Transient noise free type amplifier circuit. 4,446,441, Cl. 330-149.000.

Fujii, Masahiko: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.

Fujikura Cable Works, Limited, The: *See*—
Takaoka, Michio; Ono, Motoyuki; Kaji, Isao; and Yagi, Shigeki, 4,446,331, Cl. 174-73.00R.

Fujioka, Atsushi: *See*—
Miyadera, Yasuo; Fujioka, Atsushi; Kumazawa, Tetsuo; and Doi Hiroaki, 4,446,191, Cl. 428-245.000.

Fujioka, Satoru: *See*—
Ishii, Tetsuro; Oyama, Tadanori; Yamashita, Masashi; Kzome, Kazuyuki; Ikeda, Tsutomu; and Fujioka, Satoru, 4,445,981, Cl. 204-18.100.

Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, to Agency of Industrial Science and Technology. Method of manufacturing aluminum by using blast furnace. 4,445,934, Cl. 75-68.00A.

Fujitsu Limited: *See*—
Kishimoto, Satoru; Atsumi, Masaharu; and Sano, Yoshiaki, 4,446,499, Cl. 361-92.000.
Kurafuji, Setsuo, 4,446,386, Cl. 307-449.000.
Sato, Kiyoshi; Terashima, Minoru; Sorimachi, Haruo; Naka, Toshiaki; Kanno, Takeo; and Yamada, Fumiaki, 4,446,355, Cl. 219-216.000.
Taira, Shigenobu, 4,446,384, Cl. 307-297.000.

Fujitsu Ten Limited: *See*—
Kishimoto, Satoru; Atsumi, Masaharu; and Sano, Yoshiaki, 4,446,499, Cl. 361-92.000.

Fujiwara, Michiaki: *See*—
Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, 4,445,252, Cl. 19-244.000.

Fukase, Hiroshi: *See*—
Horii, Satoshi; and Fukase, Hiroshi, 4,446,319, Cl. 544-92.000.

Fukuda, Kenzo: *See*—
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, 4,445,934, Cl. 75-68.00A.

Fukuda, Kunio; Tazaki, Kichiya; Takano, Akihisa; and Kusumi, Yuji, to Asahi-Dow Limited. Resin composition having nice color tone and high crack-resistance. 4,446,272, Cl. 524-465.000.

Fukushima, Masao; and Yazaki, Komei, to Nissan Motor Company, Limited. Engine mounting structure. 4,445,662, Cl. 248-559.000.

Fullam, Philip S., to Yellow Springs Instrument Company, Inc., The. Electrical cable connector. 4,445,742, Cl. 339-61.00M.

Fuller, Harrison W., to Sanders Associates, Inc. Dispersive delay lines. 4,446,566, Cl. 375-96.000.

Funk, Charles F., to Metal Parts, Inc. Method of attaching a wear strip to downhole members. 4,445,727, Cl. 308-4.00A.

Furnco Construction Corporation: *See*—
Husher, Lee K., 4,445,977, Cl. 202-223.000.

Furnish, Alan G.: *See*—
Athey, Roderick E.; and Furnish, Alan G., 4,445,537, Cl. 137-572.000.

Furukawa Electric Co., Ltd., The: *See*—
Nakae, Hiroyuki; Noguchi, Isamu; and Kondo, Masayuki, 4,446,254, Cl. 521-92.000.

Furuno, Yoshikuni: *See*—
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, 4,445,946, Cl. 148-36.000.

Furusho, Takao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.

Fuse, Masashi: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.

Gaal, Antal: *See*—
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.

Gabor, Gabriel, to Frager, Jean. High power electric generator, especially adapted for powering processes involving discharge in a rarified atmosphere. 4,446,560, Cl. 373-25.000.

Gabriel, Naeem B. Hydraulic cyclo-jet engine. 4,445,327, Cl. 60-325.000.

Gaffney, Donald P.; Grise, Gary D.; and Lam, Chung H., to International Business Machines Corporation. Non-inverting non-volatile dynamic RAM cell. 4,446,535, Cl. 365-149.000.

Gai, Eliezer: *See*—
Walker, Bruce K.; Desai, Mukund; and Gai, Eliezer, 4,445,421, Cl. 91-186.000.

Galaske, Folker: *See*—
Deeg, Reinhard; Galaske, Folker; and Kettenbach, Helmuth, 4,445,647, Cl. 242-68.400.

Galasko, Gail: *See*—
Larner, Joseph; Cheng, Kang; and Galasko, Gail, 4,446,064, Cl. 260-112.00R.

Gallagher, Edward J.: *See*—
Caldwell, George R.; and Gallagher, Edward J., 4,445,258, Cl. 29-156.70R.
Galle, Edward L.; Hyldon, Roy G.; and Egar, William P., to Pillsbury Company, The. Process of manufacturing a starch-based food product. 4,446,163, Cl. 426-448.000.
Gamo, Takaharu; Moriwaki, Yoshio; and Yamashita, Toshio, to Matsushita Electric Industrial Co., Ltd. Material for hydrogen absorption and desorption. 4,446,121, Cl. 423-644.000.
GAO Gesellschaft fur Automation und Organisation mbH.: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,446,204, Cl. 428-323.000.
Garcia, Mario C. Skate boot cover. 4,445,287, Cl. 36-106.000.
Garrett Corporation, The: *See*—
Kinsell, Robert C.; and Noe, James C., 4,445,639, Cl. 237-81.000.
Mitchell, John D., 4,445,532, Cl. 137-495.000.
Tippetts, Thomas B., 4,445,377, Cl. 73-516.0LM.
Gartman, Donald L.: *See*—
Gartman, Rayburn L.; Gartman, Donald L.; and Kimmons, Kenneth T., 4,445,630, Cl. 222-464.000.
Gartman, Rayburn L.; Gartman, Donald L.; and Kimmons, Kenneth T. Emergency recovery system. 4,445,630, Cl. 222-464.000.
Gaudiana, Russell: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell; and Sahatjian, Ronald A., 4,446,305, Cl. 528-348.000.
Gaymans, Reinoud J.; and van Asperen, Pieter J., to Stamicarbon B.V. Highly stable nylon 4,6 objects. 4,446,304, Cl. 528-335.000.
Gebeyehu, Gulilat: *See*—
Marquez, Victor E.; Cooney, David A.; Gebeyehu, Gulilat; and Jayaram, Hiremagalur N., 4,446,315, Cl. 536-27.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH: *See*—
Groger, Hans; and Harms, Ernst E., 4,445,724, Cl. 299-81.000.
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., to United States of America, National Aeronautics and Space Administration. Overlay metallic-cermet alloy coating systems. 4,446,199, Cl. 428-639.000.
Gehringer, Hans: *See*—
Bucheler, Manfred; Klinksiek, Bernd; Gehringer, Hans; and Schnoring, Hildegard, 4,446,127, Cl. 424-59.000.
Geiss, Sieghart, to Daimler-Benz Aktiengesellschaft. Track guided vehicle. 4,445,440, Cl. 105-215.00R.
Gellert, Jobst U. Sprue bushing connector assembly. 4,446,360, Cl. 219-421.000.
Genba, Yasushi: *See*—
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, 4,446,347, Cl. 200-144.00R.
Genentech, Inc.: *See*—
Seeburg, Peter H., 4,446,235, Cl. 435-91.000.
General Electric Company: *See*—
Aird, Alanson D., 4,446,375, Cl. 250-551.000.
Baertsch, Richard D.; and Engeler, William E., 4,446,532, Cl. 364-824.000.
Cheng, Bo-Ching; Rosenbaum, Herman S.; and Armijo, Joseph S., 4,445,942, Cl. 148-6.300.
Davis, Lewis B., Jr.; and Dibelius, Norman R., 4,445,339, Cl. 60-749.000.
Jarvinen, Willard B., 4,446,512, Cl. 363-39.000.
Johnson, Peter D.; and Silverstein, Seth D., 4,446,397, Cl. 313-25.000.
Kim, Bang M.; and Weininger, Joseph L., 4,445,990, Cl. 204-151.000.
Kure-Jensen, Jens; and Marshall, Robert A., 4,446,377, Cl. 290-52.000.
Ladusaw, William T., 4,445,344, Cl. 62-324.600.
Lee, Garland G., 4,446,268, Cl. 524-315.000.
Loucks, George R., 4,446,278, Cl. 525-92.000.
Lovgren, Eric M.; Golba, Joseph C., Jr.; and Reed, Randall A., 4,446,090, Cl. 264-211.000.
Mark, Victor; and Hedges, Charles V., 4,446,285, Cl. 525-439.000.
Mark, Victor; and Hedges, Charles V., 4,446,298, Cl. 528-204.000.
McCarty, William J., 4,445,343, Cl. 62-324.100.
Ouellette, Maurice J.; and Hughes, William C., 4,446,462, Cl. 340-825.070.
Rosenquist, Niles R., 4,446,296, Cl. 528-198.000.
Sands, Robert W., 4,446,511, Cl. 362-267.000.
Smith, Peter H., 4,446,349, Cl. 219-10.55F.
Tupper, Leland C., 4,446,414, Cl. 318-723.000.
Wells, Robert C., 4,445,375, Cl. 73-504.000.
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Friedman, Herman H.; Del Valle, Frank; and Hofmann, Lisa A., 4,446,161, Cl. 426-335.000.
Malizia, Peter D.; and Trumbetas, Jerome F., 4,446,162, Cl. 426-424.000.
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Bohme, Rolf C.; and Lazerson, Max M., 4,445,615, Cl. 209-555.000.
General Motors Corporation: *See*—
Baxter, William J., 4,445,999, Cl. 204-414.000.
Chana, Howard E., 4,445,602, Cl. 192-53.00F.
Coleman, John R., 4,445,333, Cl. 60-578.000.
Derrick, Dennis P., 4,445,334, Cl. 60-585.000.
Harvey, Dennis L., 4,445,957, Cl. 156-180.000.
Hoffman, Charles T., Jr., 4,445,594, Cl. 188-73.370.
Langmesser, Otto J., Jr.; and Rees, Richard W. A., 4,445,661, Cl. 248-394.000.
Lutfy, Joseph P.; Grabowski, Thaddeus J.; and Arnold, Robert G., 4,445,979, Cl. 204-15.000.
Lyon, Harry H., 4,445,326, Cl. 60-277.000.
McCreary, Charles H., 4,445,337, Cl. 60-608.000.
Meixell, Richard D., 4,445,530, Cl. 137-381.000.
Melinat, Wolfgang, 4,445,330, Cl. 60-545.000.
Melinat, Wolfgang, 4,445,335, Cl. 60-589.000.
Oakes, Edmond G.; Arndt, Frederick P.; and Grandel, Leonard F., 4,445,708, Cl. 280-777.000.
Reinke, Paul E., 4,446,523, Cl. 364-431.050.
Rogers, Lloyd W., Jr., 4,445,604, Cl. 192-71.000.
Schaper, Dieter, 4,445,722, Cl. 297-468.000.
Stoltman, Donald D.; Kabasin, Daniel F.; and Field, Martin J., 4,445,369, Cl. 73-204.000.
Tison, Richard P., 4,445,984, Cl. 204-49.000.
Trippett, Richard J., 4,445,792, Cl. 384-103.000.
General Refractories Company: *See*—
Samanta, Sudarsan C., 4,446,040, Cl. 252-62.000.
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Binder, Paul B.; and Di Napoli, Louis D., 4,445,383, Cl. 73-718.000.
Caldwell, George R.; and Gallagher, Edward J., 4,445,258, Cl. 29-156.70R.
GEO Vann, Inc.: *See*—
Vann, Roy R., 4,445,574, Cl. 166-268.000.
George, Irwin S. Precision aligned split V-block. 4,445,678, Cl. 269-88.000.
Georgia-Pacific Corporation: *See*—
Hulford, Karen F.; and Price, Jerry W., 4,445,940, Cl. 134-2.000.
Gercekci, Anil; and Maeder, Heinz B., to Motorola, Inc. Means and method for disabling access to a memory. 4,446,475, Cl. 357-40.000.
Gergely, John S., to Conoco Inc. Apparatus for detecting oil in water. 4,446,370, Cl. 250-301.000.
Gerhart, Fritz; and Van Dorsselaer, Viviane, to Merrell Toraude et Compagnie. Decarboxylase-inhibiting fluorinated pentane diamine derivatives. 4,446,151, Cl. 424-319.000.
Germain, Alfred: *See*—
Viannay, Stephane; Germain, Alfred; and Sebbah, Jack, 4,445,525, Cl. 134-122.00R.
Germanas, Dalia: *See*—
Qualeatti, Gail M.; and Germanas, Dalia, 4,446,073, Cl. 260-409.000.
Gerstmann, Joseph; and Vasilakis, Andrew D., to Advanced Mechanical Technology, Inc. High efficiency water heating system. 4,445,464, Cl. 122-16.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Linke, Horst; Albers, Josef; and Erwien, Helmut, 4,445,878, Cl. 474-92.000.
Gianturco, Cesare, to Cook, Inc. Catheter plug. 4,445,896, Cl. 604-238.000.
Giddey, Claude; and Dove, Georges, to Battelle Memorial Institute. Chocolate composition for the preparation of heat-resistant chocolate articles and process for its preparation. 4,446,166, Cl. 426-631.000.
Gill, Martin S. Tanks for transporting liquids. 4,445,624, Cl. 220-449.000.
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, to Nitrokemia Ipartelepek; and Novenyvedelmi Kutato Intezet. Herbicidal compositions containing N-(phosphonomsethyl)-glycine. 4,445,927, Cl. 71-86.000.
Gisler, Roland: *See*—
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,446,128, Cl. 424-88.000.
Giustino, John. Bolt anchor especially for use in hard materials. 4,445,812, Cl. 411-57.000.
Givens, Wyatt W.; and Allen, Linus S., to Mobil Oil Corporation. Method and system for radioactive assaying. 4,446,369, Cl. 250-270.000.
Glab, Edwin F.: *See*—
Spinelli, Richard A.; and Glab, Edwin F., 4,445,774, Cl. 355-71.000.
Glacier Metal Company, Limited, The: *See*—
New, Nigel H.; and O'Rourke, John B., 4,445,592, Cl. 184-6.130.
Glasgow, Thomas K.: *See*—
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,446,199, Cl. 428-639.000.
Glasteel Tennessee, Inc.: *See*—
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,446,173, Cl. 427-206.000.
Glaxo Operations U.K. Limited: *See*—
Gregson, Michael; and Sykes, Richard B., 4,446,317, Cl. 544-22.000.
Gleim, Robert D., to Rohm and Haas Company. Polyacetylene with pyrogallol or hydrosulfite system. 4,446,310, Cl. 528-487.000.
Global Marine Inc.: *See*—
Beckman, Wayne C.; and Harwell, Patrick E., 4,445,395, Cl. 74-501.00R.
Globe Tool & Engineering Company, The: *See*—
Finegold, Hyman B., 4,446,393, Cl. 310-184.000.
Goebel, Franz; and Slavin, Morton A., to GTE Communications Products Corporation. Reserve electrochemical battery. 4,446,211, Cl. 429-101.000.
Gohausen, Hans J.; Kirchhoff, Winfried; Lindener, Jurgen; and Wennemann, Harald, to Henkel KGaA. Sealing asodically produced oxide layers, on aluminum. 4,445,983, Cl. 204-35.00N.
Golba, Joseph C., Jr.: *See*—
Lovgren, Eric M.; Golba, Joseph C., Jr.; and Reed, Randall A., 4,446,090, Cl. 264-211.000.
Gold, Nicholas, to Polaroid Corporation. Photographic film assemblage with improved leader. 4,445,768, Cl. 354-275.000.

Golda, Eugene: *See—*
Herting, Hans P.; Huang, Jen-Chi; and Golda, Eugene, 4,446,221, Cl. 430-302.000.

Goldberg, Norman: *See—*
Currie, Thomas P.; and Goldberg, Norman, 4,446,477, Cl. 357-74.000.

Goldsmid, Hiroshi J., to Unisearch Limited. Hardness tester. 4,445,367, Cl. 73-81.000.

Golub, Gregory J.; and Jenkins, Albert M., to Westinghouse Electric Corp. Switch mechanism for transformer. 4,446,343, Cl. 200-11.0TC.

Gonzalez, Fernando. Record cleaning device. 4,446,547, Cl. 369-74.000.

Gooding, Robert J., to Action Concepts, Inc. Portable tool for affixing terminals onto battery cables. 4,445,358, Cl. 72-416.000.

Goodyear Tire & Rubber Company, The: *See—*
Benko, David A., 4,446,197, Cl. 428-625.000.
Caillet, Eugene, 4,445,640, Cl. 238-8.000.
Cottman, Kirkwood S., 4,446,264, Cl. 524-109.000.
Heater, Paul L., Jr., 4,446,271, Cl. 524-441.000.
Parker, Dane K., 4,446,284, Cl. 525-383.000.
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., 4,446,198, Cl. 428-625.000.

Googin, John M.: *See—*
Compere, Alicia L.; Googin, John M.; and Griffith, William L., 4,445,908, Cl. 44-56.000.

Gosney, William M.: *See—*
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Gosset, Serge: *See—*
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Gosudarstvenny Proektny I Nauchno-Issledovatelsky Institut Gipronikel: *See—*
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Kelier, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Gotoh, Masao: *See—*
Waragai, Kenichi; Gotoh, Masao; Yokono, Hitoshi; and Iijima, Kazumi, 4,446,185, Cl. 428-67.000.

Gowing, James R., to EBSCO Industries, Inc. Fishing lure having a paddle-like member. 4,445,294, Cl. 43-42.470.

Goyarts, Wynand M., to Lee-Norse Company. Rotating device for drill mast. 4,445,663, Cl. 248-652.000.

Grabatsch, Franz: *See—*
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

Grabbe, Dimitry G., to AMP Incorporated. Ceramic chip carrier with removable lead frame support and preforated ground pad. 4,445,271, Cl. 29-589.000.

Grabowski, Thaddeus J.: *See—*
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Graf, Heinz: *See—*
Ebermann, Joachim; Graf, Heinz; Schleicher, Siegfried; and Uhlig, Jurgen, 4,446,408, Cl. 318-600.000.

Grana, Gary G. Apparatus for observing framed items. 4,445,870, Cl. 434-76.000.

Grand Chavin, Paul: *See—*
Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, 4,445,785, Cl. 368-187.000.

Grandel, Leonard F.: *See—*
Oakes, Edmond G.; Arndt, Frederick P.; and Grandel, Leonard F., 4,445,708, Cl. 280-777.000.

Graser, Fritz, to BASF Aktiengesellschaft. Perylenetetracarboxylic acid diimides and their use. 4,446,324, Cl. 546-37.000.

Grauzer, Attila: *See—*
Cisar, James R.; and Grauzer, Attila, 4,445,837, Cl. 425-141.000.

Gray, Cameron B.: *See—*
Leitch, James K.; Newman, Raymond C.; and Gray, Cameron B., 4,445,656, Cl. 248-49.000.

Gray, Kenneth P., to Carrier Corporation. Pressure differential gage and a method for detecting the presence of noncondensible gases in a refrigeration system. 4,445,366, Cl. 73-64.200.

Green Cross Corporation, The: *See—*
Naito, Ryoichi; Suyama, Tadakazu; and Iga, Yoshiro, 4,446,134, Cl. 424-101.000.

Greenwell, Bartley A.: *See—*
Czyzewski, Ted S.; and Greenwell, Bartley A., 4,445,429, Cl. 99-455.000.

Gregson, Michael; and Sykes, Richard B., to Glaxo Operations U.K. Limited. Cephalosporin antibiotics. 4,446,317, Cl. 544-22.000.

Grenier, Aime J.; and Hirsbrunner, Hans G., to Texas Instruments Incorporated. Remote control circuit breaker circuit. 4,446,500, Cl. 361-103.000.

Grenier, Aime J.: *See—*
Peterson, Robert W.; Grenier, Aime J.; and Hirsbrunner, Hans G., 4,446,501, Cl. 361-114.000.

Griffith, James L.: *See—*
Cole, William E.; O'Connell, Drew P.; and Griffith, James L., 4,445,919, Cl. 65-27.000.

Griffith, William L.: *See—*
Compere, Alicia L.; Googin, John M.; and Griffith, William L., 4,445,908, Cl. 44-56.000.

Grimoldi, Ranaldo H.: *See—*
Powers, Joseph E.; Grimoldi, Ranaldo H.; Williamson, Calvin C.; and Bottini, Alfred A., 4,445,357, Cl. 72-399.000.

Grinberg, Grigory M.: *See—*
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., 4,446,316, Cl. 536-112.000.

Grise, Gary D.: *See—*
Gaffney, Donald P.; Grise, Gary D.; and Lam, Chung H., 4,446,535, Cl. 365-149.000.

Groen Division - Dover Corporation: *See—*
Czyzewski, Ted S.; and Greenwell, Bartley A., 4,445,429, Cl. 99-455.000.

Groff, Edwin T. Apparatus for extruding a comestible. 4,445,838, Cl. 425-319.000.

Groff, James W. Telephone number coding device. 4,446,334, Cl. 179-81.00R.

Groger, Hans; and Harms, Ernst E., to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH. Cutter-loader apparatus having overhung shearer drum. 4,445,724, Cl. 299-81.000.

Grois, Igor; Margolin, Mark; and Berg, Alan, to TRW Inc. Articulating fiber optic connectors with resilient mounting block. 4,445,750, Cl. 350-96.210.

Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Composition and process for the treatment of keratin materials with polymers. 4,445,521, Cl. 132-7.000.

Grumman Aerospace Corporation: *See—*
Berde, Dennis W., 4,446,421, Cl. 324-52.000.

GTE Automatic Electric Incorporated: *See—*
Chang, Chieh; and Lee, Man S., 4,446,438, Cl. 328-127.000.

GTE Automatic Electric Labs Inc.: *See—*
Rinaldi, Gerald M., 4,446,437, Cl. 328-120.000.
Webber, Robert C., 4,446,553, Cl. 370-62.000.
Webber, Robert C., 4,446,554, Cl. 370-62.000.

GTE Communications Products Corporation: *See—*
Goebel, Franz; and Slavin, Morton A., 4,446,211, Cl. 429-101.000.

GTE Laboratories Incorporated: *See—*
Pappalardo, Romano G.; and Peters, Thomas E., 4,446,049, Cl. 252-301.60P.
Tweedy, Ernest P., 4,446,552, Cl. 370-58.000.

GTE Products Corporation: *See—*
Scholz, John A., 4,445,847, Cl. 431-362.000.

Guenther, Wolfgang: *See—*
Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, 4,446,253, Cl. 521-79.000.

Guenthner, Richard A.; and Stivers, David A., to Minnesota Mining and Manufacturing Company. Vulcanizing fluorocarbon elastomers with one or a mixture of aromatic compounds having hydroxyl and oxyallyl groups. 4,446,270, Cl. 524-433.000.

Gulf Research & Development Company: *See—*
Templin, Philip R., 4,446,087, Cl. 264-148.000.

Guloian, Jury A.: *See—*
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Gulyas, Donald J.: *See—*
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Gundle Holdings (Proprietary) Limited: *See—*
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Gurnee, Mark N., to Honeywell Inc. Detector cold shield. 4,446,372, Cl. 250-334.000.

Gusevsky Fulual Gosudarstvennogo Nauchno-Issledovatelskogo Institut Stekla: *See—*
Eremeev, Vadim V.; and Guloian, Jury A., 4,445,922, Cl. 65-120.000.

Gust, Jacob N., to Concord, Inc. Sunflower header attachment. 4,445,314, Cl. 56-126.000.

Gustafsson, Sten-Ake: *See—*
Banner, Kurt A.; and Gustafsson, Sten-Ake, 4,445,558, Cl. 144-341.000.

Guth, William R., to Siemens Gammasonics, Inc. Collimator for a radiation detector and method of making same. 4,446,570, Cl. 378-149.000.

Haaf, Franz: *See—*
Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, 4,446,277, Cl. 525-68.000.

Haas, Rudiger: *See—*
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Hachiya, Iwao; Mochizuki, Keizo; and Kuwada, Yukio, to Meiji Seika Kaisha, Ltd. Method of preparing dried ginseng for drug. 4,446,130, Cl. 424-195.000.

Haddad, James H.: *See—*
Buyan, Frank M.; and Haddad, James H., 4,446,107, Cl. 422-107.000.

Hadjicostis, Andreas, to Technicare Corporation. Short ring down, ultrasonic transducer suitable for medical applications. 4,446,395, Cl. 310-327.000.

Haemonetics Corporation: *See—*
Schroendorfer, Donald W., 4,445,883, Cl. 494-21.000.

Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, to BASF Aktiengesellschaft. Production of fine-celled foams from styrene polymers. 4,446,253, Cl. 521-79.000.

Hahnemann University: *See*—
Woo, David V., 4,446,123, Cl. 424-1.100.
Hahnke, Manfred; and Teige, Wolfgang, to Hoechst Aktiengesellschaft. Process for continuously dyeing in the gel state fiber material of acrylonitrile polymers spun from organic solvents with carbinol- or anhydro base of basic dye. 4,445,904, Cl. 8-538.000.
Hait, James M., to International Hardware, Inc. Rotary stripper. 4,445,248, Cl. 15-198.000.
Hakhverdian, Armik A. Linear self-excited capacitance bridge. 4,446,423, Cl. 324-60.00C.
Halene, Clemens; Strack, Karl-Ludwig; Lange, Ernst; and Henrichs, Franz-Josef, to Mannesmann AG. Vessel for use in hydrogen/hydride technology. 4,446,111, Cl. 422-200.000.
Hall, Allen L.: *See*—
Fayter, Richard G., Jr.; and Hall, Allen L., 4,446,077, Cl. 260-465.00K.
Hall, Henry J.; and Haygreen, John G., to University of Minnesota, Regents of the. Compression shear test jig. 4,445,387, Cl. 73-845.000.
Hall, James E.: *See*—
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,445,562, Cl. 152-347.000.
Halliburton Company: *See*—
Byrd, Audis C.; Todd, Bradley L.; and Pattison, William W., Jr., 4,445,465, Cl. 122-392.000.
Hushbeck, Donald F., 4,445,571, Cl. 166-317.000.
Zimmer, Mark D., 4,446,540, Cl. 367-26.000.
Hamada, Osamu: *See*—
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Hambrecht, Juergen: *See*—
Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, 4,446,277, Cl. 525-68.000.
Hammerling, Gunter; Muller, Ingo; and Menger, Erich, to Deutsches Krebsforschungszentrum. Apparatus for transferring sample vessels into collecting vessels. 4,446,104, Cl. 422-63.000.
Hancor, Inc.: *See*—
Fouss, James L.; and Parker, John J., 4,445,542, Cl. 138-94.000.
Handa, Hideyuki: *See*—
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Handbury, Dana: *See*—
Handbury, James W.; and Handbury, Dana, 4,445,654, Cl. 244-139.000.
Handbury, James W.; and Handbury, Dana. Aircraft recovery chute. 4,445,654, Cl. 244-139.000.
Hanna, Daniel C. Tensioning device for wraparound brushing mechanism. 4,445,246, Cl. 15-53.0AB.
Hanna, Marie R.: *See*—
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,446,060, Cl. 252-522.00R.
Hansen, Axel E., Jr.; and Richardson, James C. Machine for heating elongated flat surfaces. 4,445,850, Cl. 432-229.000.
Hansen, Bent J.; and Thompson, Clifford F., to Cliffside Pipelayers. Clamping apparatus for plastic pipe. 4,445,677, Cl. 269-41.000.
Hansmann, Johann: *See*—
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Hanyzewski, Eugene F.; French, Kenneth A.; and Walker, Thomas S. Apparatus for shaping a wooden workpiece. 4,445,553, Cl. 144-145.00A.
Hara, Eiichi: *See*—
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Harada, Hiroshi: *See*—
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Harada, Shoichiro: *See*—
Yamasaki, Harumasa; and Harada, Shoichiro, 4,446,261, Cl. 524-40.000.
Harbison, William H.; and Mohnach, Michael G., to Anderson Company of Indiana, The. Rock-to-lock connection arm-to-blade. 4,445,249, Cl. 15-250.320.
Harley-Davidson Motor Co., Inc.: *See*—
Hillman, Michael J., 4,445,587, Cl. 180-229.000.
Harms, Ernst E.: *See*—
Groger, Hans; and Harms, Ernst E., 4,445,724, Cl. 299-81.000.
Harper, James M. E.: *See*—
Cuomo, Jerome J.; Harper, James M. E.; and Kaufman, Harold R., 4,446,403, Cl. 315-111.810.
Harris Corporation: *See*—
Donovan, Joseph A., 4,446,465, Cl. 343-797.000.
Patterson, Raymond B., III, 4,446,444, Cl. 330-264.000.
Harry, Alan, to Thule United Limited a British Company. Vibratory screening apparatus for screening liquids. 4,446,022, Cl. 210-388.000.
Hartmann, Albert: *See*—
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Harvey, Barrie J.; and Mann, Ian J., to M. H. Detrick Company, Limited. Method of veneering brick linings of furnaces and other high temperature enclosures. 4,446,082, Cl. 264-30.000.
Harvey, Dennis L., to General Motors Corporation. Method and means for making constant cross sectional area pultruded fiber reinforced polymeric articles. 4,445,957, Cl. 156-180.000.
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Hasegawa, Akira: *See*—
Sakaguchi, Katsuyoshi; and Hasegawa, Akira, 4,445,834, Cl. 425-36.000.
Hasegawa, Shumpei; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio feedback control system adapted to obtain stable engine operation under particular engine operating conditions. 4,445,482, Cl. 123-489.000.
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Hashizume, Miyakazu: *See*—
Sakai, Masao; Hashizume, Miyakazu; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,446,058, Cl. 252-507.000.
Haskel, Incorporated: *See*—
Kelly, John W., 4,445,261, Cl. 29-157.400.
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Ikematu, Takeshi; and Hattori, Yasuo, 4,446,290, Cl. 526-174.000.
Hattori, Yoshiyuki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.
Hauer, Harvey J.: *See*—
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Hinz, Werner; and Tolasch, Gerhard, 4,445,519, Cl. 131-94.000.
Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Percussor assembly. 4,445,503, Cl. 128-40.000.
Hawk, Thomas W., to PPG Industries, Inc. Method of forming shaped laminates. 4,445,953, Cl. 156-102.000.
Hayakawa, Yoshikazu: *See*—
Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, 4,445,584, Cl. 180-69.220.
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Hayashi, Masaki: *See*—
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Hayashi, Mikio. Automatic switching system for car cooler. 4,445,341, Cl. 62-133.000.
Hayashi, Seiichi; and Hara, Eiichi, to Hitachi, Ltd. Photoelectric converter on a transmissive substrate having light shielding. 4,446,364, Cl. 250-211.00R.
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Hayashi, Tsutomu; and Shigihara, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Stand device for two-wheeled vehicles. 4,445,705, Cl. 280-302.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Low noise level automotive internal combustion engine. 4,445,471, Cl. 123-198.00E.
Hayashida, Nobuo: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.
Hayes, Jess W. Brake for drafting parallel. 4,445,280, Cl. 33-443.000.
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Haynes, Andrew: *See*—
Fineberg, Douglas H.; and Haynes, Andrew, 4,445,572, Cl. 166-188.000.
Heater, Paul L., Jr., to Goodyear Tire & Rubber Company, The. Body solder of powdered aluminum and a polyester. 4,446,271, Cl. 524-441.000.
Heath, Martin: *See*—
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Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,446,285, Cl. 525-439.000.
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Hedrick, Warren R., to Interpace Corporation. Air register with automatic zone control. 4,445,637, Cl. 236-49.000.
Heidemeyer, Paulus: *See*—
Hofbauer, Peter; Heidemeyer, Paulus; and Scholz, Romanus, 4,445,601, Cl. 192-48.800.
Heidinger, Kurt S.: *See*—
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Height, Inc.: *See*—
Shinriki, Tatsuo, 4,446,160, Cl. 426-297.000.
Heinemans, Henricus T. J. M. Cooler for granular products. 4,445,282, Cl. 34-168.000.
Helgeland, Jon L.: *See*—
Kumar, Ashok; Segan, Ellen G.; Bukowski, John M.; and Helgeland, Jon L., 4,445,989, Cl. 204-147.000.
Heller, Anton H., to Poweray Infrared Corporation. Asphalt reclamation system and unit. 4,445,848, Cl. 432-13.000.
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Dauser, William C., Jr., 4,446,332, Cl. 174-87.000.
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Gohausen, Hans J.; Kirchhoff, Winfried; Lindener, Jurgen; and Wennemann, Harald, 4,445,983, Cl. 204-35.00N.
Preuss, Wolfgang, 4,446,072, Cl. 260-397.450.

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Heraeus Quarzschmelze GmbH: *See*—
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Bullen, Lee; and Hermach, Carl J., 4,445,881, Cl. 493-424.000.
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Krismer, Bruno; and Hoppe, Axel, 4,446,116, Cl. 423-63.000.
Herrington, Lawrence: *See*—
Avra, Raymond E.; and Herrington, Lawrence, 4,445,650, Cl. 242-192.000.
Herting, Hans P.; Huang, Jen-Chi; and Golda, Eugene, to Polychrome Corporation. Anodized supports and radiation sensitive elements therefrom. 4,446,221, Cl. 430-302.000.
Herzl, Peter J.; and Strohmeier, Warren O., to Fischer & Porter Company. Dual-body vortex-shedding flowmeter. 4,445,388, Cl. 73-861.240.
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Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,446,365, Cl. 250-213.00R.
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Bell, R. Frank, 4,446,440, Cl. 330-10.000.
Hexcel Corporation: *See*—
Freeman, Bob L.; and Borris, Peter W., 4,445,956, Cl. 156-154.000.
Heyman, Philip M., to RCA Corporation. Workpiece with abraded machine-readable marking therein and method of making. 4,446,362, Cl. 235-462.000.
Hicks, Darrell D., to Celanese Corporation. Epoxide resin aqueous dispersant comprising the reaction product of diisocyanate, diol and polyether glycol monoether. 4,446,256, Cl. 523-402.000.
Higaki, Hiroshi: *See*—
Saho, Norihide; Koibuchi, Koji; Kasai, Kenjiro; and Higaki, Hiroshi, 4,445,569, Cl. 165-165.000.
Higashi, Katunori, to Nissan Motor Company, Limited. Exhaust gas recirculation system for an internal combustion engine. 4,445,487, Cl. 123-568.000.
Higashiizumi, Takao: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Sano, Shinichi; and Higashiizumi, Takao, 4,445,379, Cl. 73-631.000.
Hillman, Michael J., to Harley-Davidson Motor Co., Inc. Motorcycle cooling system. 4,445,587, Cl. 180-229.000.
Hinden, Jean M., to Diamond Shamrock Corporation. Recoating of electrodes. 4,446,245, Cl. 502-101.000.
Hinshaw, Howard G.: *See*—
Jordan, William D.; Hinshaw, Howard G.; and Clemens, Donald L., 4,446,504, Cl. 361-386.000.
Hintsch, Otto, to Sulzer Brothers Limited. Method of operating a weaving machine. 4,445,546, Cl. 139-435.000.
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Hirao, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a semiconductor integrated circuit BI-MOS device. 4,445,268, Cl. 29-571.000.
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Tanouchi, Tadao; Shigeoka, Satoshi; Kawamura, Masanori; Hayashi, Masaki; Terashima, Hiroshi; and Hirata, Fumio, 4,446,143, Cl. 424-270.000.
Hirate, Naoyuki: *See*—
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Hirayama, Hiromichi, to Victor Company of Japan, Limited. Video head driving unit with nonlinear leaf spring force. 4,446,497, Cl. 360-109.000.
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Hirsbrunner, Hans G.: *See*—
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Peterson, Robert W.; Grenier, Aime J.; and Hirsbrunner, Hans G., 4,446,501, Cl. 361-114.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
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Hitachi Chemical Company, Ltd.: *See*—
Miyadera, Yasuo; Fujioka, Atsushi; Kumazawa, Tetsuo; and Doi Hiroaki, 4,446,191, Cl. 428-245.000.
Hitachi, Ltd.: *See*—
Hayashi, Seiichi; and Hara, Eiichi, 4,446,364, Cl. 250-211.00R.
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Katsura, Koyo; and Maejima, Hideo, 4,446,517, Cl. 364-200.000.
Kumada, Masaharu; and Misumi, Akira, 4,446,404, Cl. 313-346.00R.
Kuzuya, Kaneharu; Ishida, Giichi; and Ishizaki, Kosho, 4,445,449, Cl. 112-121.110.
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Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Saho, Norihide; Koibuchi, Koji; Kasai, Kenjiro; and Higaki, Hiroshi, 4,445,569, Cl. 165-165.000.
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Waragai, Kenichi; Gotoh, Masao; Yokono, Hitoshi; and Iijima, Kazumi, 4,446,185, Cl. 428-67.000.
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, to Dow Chemical Company, The. Aqueous dispersions of vinylidene chloride resins. 4,446,273, Cl. 524-556.000.
Hobes, John; Payer, Wolfgang; and Deymann, Detlef, to Ruhrchemie Aktiengesellschaft. Process for preparing pulverulent ethylene polymers. 4,446,311, Cl. 528-493.000.
Hobo, Sumiya; and Okamoto, Koji, to Shioda Dental Manufacturing Co., Ltd. Articulation detector CRT for articulators. 4,445,855, Cl. 433-59.000.
Hoch, Thomas M.; and Kullgren, Dennis R., to Allen-Bradley. Numerical control with paramacro capability. 4,446,525, Cl. 364-474.000.
Hodrien, Ronald C.: *See*—
Burton, Stephen R.; Horley, Gary; and Hodrien, Ronald C., 4,446,003, Cl. 208-48.00Q.
Hodson, James V. Stripping and conditioning solutions for treating coated substrates and method for their use. 4,445,939, Cl. 134-2.000.
Hoechst Aktiengesellschaft: *See*—
Fester, Walter; and Huber, Bernd, 4,446,206, Cl. 428-364.000.
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Hoerauf, Werner: *See*—
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Hofbauer, Peter; Heidemeyer, Paulus; and Scholz, Romanus, to Volkswagenwerk Aktiengesellschaft. Vehicle having a main clutch and an auxiliary controllable clutch. 4,445,601, Cl. 192-48.800.
Hoff Companies, Inc.: *See*—
Purcell, Bill L., 4,445,411, Cl. 83-403.100.
Hoff, Raymond E., to Chemplex Company. Polymerization method. 4,446,288, Cl. 526-129.000.
Hoffman, Charles T., Jr., to General Motors Corporation. Disc brake noise reduction. 4,445,594, Cl. 188-73.370.
Hoffman, Herman S.; and Howard, Robert T., Jr., to International Business Machines Corporation. Surface treatment for ceramics to eliminate alpha particle emitting elements. 4,445,968, Cl. 156-657.000.
Hoffman, Joseph W., to AMP Incorporated. Device and method for anchoring an end of a plastic liner inside a pipe. 4,445,716, Cl. 285-55.000.
Hoffmeister, Jurgen; Ravasini, Guiseppe; and Boeckh, Franz-Xaver, to Kaltenbach & Voigt GmbH & Co. Dental equipment stand. 4,445,859, Cl. 433-79.000.
Hofmann, Lisa A.: *See*—
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Hollaway, Gerald C., Jr., to Dayco Corporation. Method of making a fiber-loaded polymeric sheet. 4,445,949, Cl. 156-62.200.
Holleman, Robert A.: *See*—
Jardine, Kenneth J.; and Holleman, Robert A., 4,446,114, Cl. 423-10.000.
Hollister Incorporated: *See*—
Jensen, Marvin E., 4,445,898, Cl. 604-337.000.
Holt, Joseph B., to United States of America, Energy. Synthesis of refractory materials. 4,446,242, Cl. 501-96.000.
Hombach, Rudolf; Nolte, Wilfried; Russell, Peter J.; and Wall, Nigel G., to Bayer Aktiengesellschaft. Process for the production of synthetic rubber latices, their use as a starting material in the production of pressure-sensitive adhesives and pressure-sensitive adhesives. 4,445,959, Cl. 156-332.000.
Honda, Chika; Iwata, Masatoshi; and Koitabushi, Takeo, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,446,228, Cl. 430-567.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,445,482, Cl. 123-489.000.
Hayashi, Tsutomu; and Shigihara, Akira, 4,445,705, Cl. 280-302.000.
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Sasaki, Takeshi; Akiba, Kiyoshi; and Takahashi, Yoshio, 4,445,399, Cl. 74-603.000.
Sato, Makoto; Ohmori, Taiji; and Tsuchiya, Yoshikazu, 4,446,522, Cl. 364-426.000.
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Honda Motor Co., Ltd.: *See*—
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Honeywell Inc.: *See*—
Carlson, Robert J.; and Youngner, Daniel W., 4,445,966, Cl. 156-643.000.
Connell, John C.; and Serber, Stephen L., 4,445,638, Cl. 237-8.00R.
Gurnee, Mark N., 4,446,372, Cl. 250-334.000.
Johnson, Allan P., 4,445,779, Cl. 356-350.000.
Nelson, Lorne W., 4,445,567, Cl. 165-29.000.
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Honeywell Information Systems Inc.: *See*—
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Hoobler, Mary A.: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,445,928, Cl. 71-87.000.
Sikorski, James A.; and Hoobler, Mary A., 4,445,929, Cl. 71-087.000.

Hopkins, John R., to AMP Incorporated. Method and apparatus for producing a premolded packaging. 4,445,736, Cl. 339-17.0CF.

Hoppe, Axel: *See*—
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Konig, Joachim; Schnalke, Karl-Erwin; Suling, Carlhans; and Horacek: Gotz, 4,446,291, Cl. 526-209.000.

Horak, Vladimir. Apparatus and method for adjustment of volumetric cavities for gravimetric metering of liquids. 4,445,627, Cl. 222-54.000.

Horeschi, Giancarlo: *See*—
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Horii, Satoshi; and Fukase, Hiroshi, to Takeda Chemical Industries, Ltd. Aminocyclitols and their production. 4,446,319, Cl. 544-92.000.

Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Method of and apparatus for reading out image information. 4,446,487, Cl. 358-280.000.

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Doerfler, Frederick B., 4,445,629, Cl. 222-148.000.

Horley, Gary: *See*—
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Horn, Uriah: *See*—
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Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,446,037, Cl. 252-47.500.

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Horvath, Andras: *See*—
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Hosaka, Hiroaki: *See*—
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Hoshi, Yoshikazu, to Hitachi, Ltd. Injection pump. 4,445,822, Cl. 417-388.000.

Hoshimi, Susumu; and Kojima, Tadashi, to Sony Corporation; and Tokyo Shibaura Denki Kabushiki Kaisha. PCM Signal processing circuit. 4,446,490, Cl. 360-32.000.

Hoskin, Dennis H., to Mobil Oil Corporation. Low cost, brine tolerant sulfonate and sulfate surfactants having 1,3-dihydrocarboxy-2-propyl hydrophobic tails. 4,446,079, Cl. 260-513.00R.

Houston Geophysical Products, Inc.: *See*—
Annoot, Ira R., 4,445,741, Cl. 339-49.00R.

Howard, Charlie J.: *See*—
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Hoffman, Herman S.; and Howard, Robert T., Jr., 4,445,968, Cl. 156-657.000.

Howey, Thomas L. Quick release helmet and strap assembly. 4,445,253, Cl. 24-68.00E.

HRI, Inc.: *See*—
Huibers, Derk T. A.; and Jenq, Cheng-Yih, 4,446,070, Cl. 260-369.000.

Hsieh, Wen-Ching; Bostich, June M.; and Koepke, Jeffery W., to Union Oil Company of California. Process for enhanced oil recovery employing petroleum sulfonate blends. 4,446,036, Cl. 252-8.55D.

Hsu, Sheng T., to RCA Corporation. Low resistance contact for high density integrated circuit. 4,445,270, Cl. 29-576.00B.

Huang, Hua-Feng; and Wallace, Walter A., to Du Pont de Nemours, E. I., and Company. Serpentine microwave applicator. 4,446,348, Cl. 219-10.55A.

Huang, Jen-Chi: *See*—
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Huber, Bernd: *See*—
Fester, Walter; and Huber, Bernd, 4,446,206, Cl. 428-364.000.

Huchette, Michel: *See*—
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Hudson Oxygen Therapy Sales Company: *See*—
Havstad, Harold R., 4,445,503, Cl. 128-40.000.

Hueberger, Lawrence K., to OMAC, Inc. Kreuger flap actuating mechanism for delta wing, canard type aircraft. 4,445,655, Cl. 244-214.000.

Hughes Aircraft Company: *See*—
Figueroa, Luis, 4,446,557, Cl. 372-45.000.

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Cunningham, Robert A., 4,445,734, Cl. 339-16.00C.

Hughes, William C.: *See*—
Ouellette, Maurice J.; and Hughes, William C., 4,446,462, Cl. 340-825.070.

Huguenin, Raymond; and Kuechli, Gottfried, to Dryan-Fordahl Technologies S.A. Method of manufacturing piezoelectric resonator components. 4,445,256, Cl. 29-25.350.

Huibers, Derk T. A.; and Jenq, Cheng-Yih, to HRI, Inc. Catalytic oxidation of polynuclear aromatic hydrocarbons. 4,446,070, Cl. 260-369.000.

Hulford, Karen F.; and Price, Jerry W., to Georgia-Pacific Corporation. Process to remove corrosion deposits using aqueous-base ferromagnetic fluids. 4,445,940, Cl. 134-2.000.

Hultsch, Gunther: *See*—
Aufderhaar, Erhard; Feiler, Johannes; Hultsch, Gunther; and Kisslinger, Walter, 4,446,021, Cl. 210-378.000.

Hung, William M.: *See*—
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Hunn, Roy: *See*—
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Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,445,943, Cl. 148-12.300.
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,445,944, Cl. 148-12.300.

Huret, Alain P. B., heir: *See*—
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Hushbeck, Donald F., to Halliburton Company. Circulation valve. 4,445,571, Cl. 166-317.000.

Husher, Lee K., to Furnco Construction Corporation. Coke oven having an offset expansion joint and method of installation thereof. 4,445,977, Cl. 202-223.000.

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McDermott, Gertrude D., 4,445,666, Cl. 254-93.00H.

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Hydroconsult, S.A.: *See*—
Oules, Jacques, 4,445,290, Cl. 37-66.000.

Hyldon, Roy G.: *See*—
Galle, Edward L.; Hyldon, Roy G.; and Egar, William P., 4,446,163, Cl. 426-448.000.

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Ichihashi, Tetsuo: *See*—
Okumura, Nobuya; Ichihashi, Tetsuo; Matsumura, Shunichi; and Inata, Hiroo, 4,446,262, Cl. 524-89.000.

ID Code Industries, Inc.: *See*—
Smagala-Romanoff, Edward A., 4,445,712, Cl. 283-75.000.

Ideal Comfort, Inc.: *See*—
Voorhees, John, 4,445,240, Cl. 5-451.000.

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Naito, Ryoichi; Suyama, Tadakazu; and Iga, Yoshiro, 4,446,134, Cl. 424-101.000.

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Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.

Ihrman, Carl-Bertil, to Floby Durk. Scaffold plank connecting arrangement. 4,445,590, Cl. 182-222.000.

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Patel, Harshad K.; and Illick, Andjelko, 4,446,188, Cl. 428-138.000.
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Imhoff, William B., to Leigh Products, Inc. Flush bolt. 4,445,717, Cl. 292-177.000.
Imperial Chemical Industries PLC: *See*—
Rose, John B.; and Cinderey, Michael B., 4,446,294, Cl. 528-128.000.
Smallwood, Peter V.; and Zichy, Erno L., 4,446,287, Cl. 526-81.000.
Thompson, David J., 4,446,047, Cl. 252-299.100.
Inata, Hiroo: *See*—
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Indech, Robert B. Method of tissue growth. 4,446,229, Cl. 435-1.000.
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Michels, Geoffrey H., 4,445,328, Cl. 60-351.000.
Industrial Filter & Pump Mfg. Co.: *See*—
Schmidt, Henry, Jr., 4,446,030, Cl. 210-805.000.
Industrie Pirelli, S.p.A.: *See*—
Cicognani, Mario, 4,445,879, Cl. 474-205.000.
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Ingalls, Robert A., to Joy Manufacturing Company. Screw rotor machine rotors and method of making. 4,445,831, Cl. 418-201.000.
Ingersoll-Rand Company: *See*—
Arya, Satya P., 4,445,808, Cl. 405-259.000.
Ingham, Francis H.: *See*—
Sedig, Albert R.; and Ingham, Francis H., 4,445,744, Cl. 339-94.00M.
Inoue, Hisashi: *See*—
Kosuda, Hironori; Takada, Masaaki; and Inoue, Hisashi, 4,445,875, Cl. 464-14.000.
Inoue, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine equipped with supercharger. 4,445,336, Cl. 60-605.000.
Inoue, Mitsumasa; Nakamura, Ken; Yokoyama, Junichi; and Yonezawa, Atsushi, to Nissan Motor Company, Limited. Intake system of internal combustion engine. 4,445,480, Cl. 123-432.000.
Inoue, Osamu: *See*—
Kono, Mitsutsugu; and Inoue, Osamu, 4,445,561, Cl. 152-209.00B.
Inoue, Takahiro: *See*—
Aoki, Takao; and Inoue, Takahiro, 4,445,772, Cl. 355-3.0CH.
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Inouye, Tamon, to Tokyo Shibaura Denki Kabushiki Kaisha. Image reconstruction apparatus and process. 4,446,521, Cl. 364-414.000.
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Wood, Eric, 4,446,181, Cl. 428-36.000.
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Willay, Gerard, 4,446,563, Cl. 373-157.000.
Instrumentation Laboratory Inc.: *See*—
Nelson, Larry A.; and Schmidt, Leon W., 4,446,106, Cl. 422-72.000.
Intercept Corporation: *See*—
Sperber, Martin, 4,446,407, Cl. 318-282.000.
International Business Machines: *See*—
Concannon, Michael P.; and Erdelyi, Charles K., 4,446,383, Cl. 307-297.000.
Levine, Lewis J.; and Shipp, Kenneth O., Jr., 4,445,795, Cl. 400-63.000.
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Bruhn, Peter H.; and Wustrau, Rolf, 4,445,272, Cl. 29-598.000.
Cuono, Jerome J.; Harper, James M. E.; and Kaufman, Harold R., 4,446,403, Cl. 315-111.810.
De La Moneda, Francisco H.; and Dockerty, Robert C., 4,445,267, Cl. 29-571.000.
Gaffney, Donald P.; Grise, Gary D.; and Lam, Chung H., 4,446,535, Cl. 365-149.000.
Hoffman, Herman S.; and Howard, Robert T., Jr., 4,445,968, Cl. 156-657.000.
Isaac, Randall D.; Ning, Tak H.; and Tang, Denny D., 4,446,476, Cl. 357-67.000.
Lisica, Vincent M.; and Ross, Charles O., 4,445,796, Cl. 400-120.000.
Orengo, Gerard; and Verhaeghe, Michel, 4,446,385, Cl. 307-355.000.
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Boden, Richard M; Vock, Manfred H.; and Tyszkiewicz, Theodore J., 4,446,157, Cl. 426-3.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.
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Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,446,060, Cl. 252-522.00R.
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Fiedler, Armin, 4,446,344, Cl. 200-83.00B.
International Hardware, Inc.: *See*—
Hait, James M., 4,445,248, Cl. 15-198.000.
International Minerals & Chemical Corp.: *See*—
Seeney, Charles E.; and Kraemer, John F., 4,445,565, Cl. 164-528.000.
International Mobile Machines Corporation: *See*—
Bolgiano, Duane R., 4,446,339, Cl. 179-84.00R.
International Paint Public Limited Company: *See*—
Woods, Richard A.; and Mehta, Rajesh R., 4,446,260, Cl. 523-409.000.
International Paper Box Machine Co., The: *See*—
Powers, Loren C., Jr., 4,445,880, Cl. 493-28.000.
International Paper Company: *See*—
Cassidy, Benjamin J., 4,445,613, Cl. 206-418.000.
International Standard Electric Corporation: *See*—
Deeg, Reinhard; Galaske, Folker; and Kettenbach, Helmuth, 4,445,647, Cl. 242-68.400.
International Telephone & Telegraph Corporation: *See*—
Endo, Teruyuki, 4,445,385, Cl. 73-726.000.
LeGrand, Jesse S.; Fockler, William; and Jezo, Mairice L. J., 4,446,464, Cl. 343-399.000.
Wagner, George K., 4,446,510, Cl. 362-267.000.
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Luijerink, Jan H., 4,446,066, Cl. 260-112.00B.
Interpace Corporation: *See*—
Hedrick, Warren R., 4,445,637, Cl. 236-49.000.
Ireland, Jeffrey R., to Mostek Corporation. Circuit for generating analog signals. 4,446,436, Cl. 328-14.000.
Irzinski, Edward P., to United States of America, Navy. Coaxial waveguide commutation feed network for use with a scanning circular phased array antenna. 4,446,463, Cl. 343-371.000.
Isaac, Randall D.; Ning, Tak H.; and Tang, Denny D., to International Business Machines Corporation. Integrated circuit having a sublayer electrical contact and fabrication thereof. 4,446,476, Cl. 357-67.000.
Isaka, Tsutomu: *See*—
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, 4,446,283, Cl. 525-344.000.
Ishida, Giichi: *See*—
Kuzuya, Kaneharu; Ishida, Giichi; and Ishizaki, Kosho, 4,445,449, Cl. 112-121.110.
Ishihama, Masao: *See*—
Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, 4,445,584, Cl. 180-69.220.
Ishii, Kenzo: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
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Ishikawa, Norio; and Omaki, Takanobu, to Minolta Camera Kabushiki Kaisha. Automatic focusing device for use in a camera. 4,445,761, Cl. 354-402.000.
Ishikawa, Shozo: *See*—
Takasu, Yoshio; and Ishikawa, Shozo, 4,446,217, Cl. 430-58.000.
Ishikawa, Takayoshi: *See*—
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, 4,446,347, Cl. 200-144.00R.
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, to Nissan Motor Company, Limited. Ignition system for starting a diesel engine. 4,445,491, Cl. 123-605.000.
Ishikawa, Yuzuru; and Tanaka, Masashi, to Nippon Kogaku K.K. Optical system of a theodolite. 4,445,777, Cl. 356-139.000.
Ishimaru, Wataru. Gear shift shock reducing apparatus for hydraulic control system of automatic transmission. 4,445,401, Cl. 74-869.000.
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Rieder, Werner; and Fehrle, Martin, 4,446,195, Cl. 428-458.000.
Ito, Mamoru: *See*—
Jiroumaru, Takashi; and Ito, Mamoru, 4,446,309, Cl. 528-486.000.
Ito, Shuichi: *See*—
Iijima, Toshikazu; and Ito, Shuichi, 4,445,417, Cl. 87-12.000.
Itoh, Satoru, to Fuji Xerox Co., Ltd. Image signal processing circuit. 4,446,486, Cl. 358-280.000.

ITT Corporation: *See*—
Sedig, Albert R.; and Ingham, Francis H., 4,445,744, Cl. 339-94.00M.

ITT Industries, Inc.: *See*—
Budecker, Ludwig, 4,445,825, Cl. 417-462.000.
Weiler, Rolf; Bischoff, Gilbert; and Schlag, Rudolf, 4,445,331, Cl. 60-547.100.

Ivanov, Andrei S.; Komorin, Leonid V.; Nikishkin, Vladimir I.; Sviniin, Mikhail P.; and Fedotov, Mikhail T. Electron beam accelerator. 4,446,374, Cl. 250-492.300.

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Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Iwai, Akira: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.

Iwakura, Ken; and Sugiyama, Takekatsu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording materials. 4,446,209, Cl. 428-411.000.

Iwanade, Hisao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Control circuit for zooming device. 4,446,526, Cl. 364-525.000.

Iwao, Suminari: *See*—
Zaita, Katsuyuki; and Iwao, Suminari, 4,445,466, Cl. 123-59.0PC.

Iwata, Masatoshi: *See*—
Honda, Chika; Iwata, Masatoshi; and Koitabashi, Takeo, 4,446,228, Cl. 430-567.000.

Izquierdo, George J. Portable case and stand for pedal controls operationally fixed therein for use with a keyboard temporarily mountable thereon. 4,445,415, Cl. 84-177.000.

Jackson, Ronnie L. Elapsed time rod and reel apparatus. 4,445,786, Cl. 368-10.000.

Jacobine, Anthony F., to Upjohn Company, The. Compositions and process. 4,446,247, Cl. 502-167.000.

Jacobsen, Ralph E. Suspended shower-tub doors with upper stabilizing means. 4,445,239, Cl. 4-607.000.

Jaeschke, Ralph L., to Eaton Corporation. Electromagnetic coupling device. 4,446,392, Cl. 310-105.000.

Jager, Horst; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Azo reactive dyestuffs. 4,446,067, Cl. 260-153.000.

Jaksha, Jerome F. Insulative structure. 4,445,958, Cl. 156-211.000.

Jalics, George. High green strength emulsion rubbers by the use of half-esters of unsaturated dicarboxylic acids. 4,446,282, Cl. 525-327.700.

Jamerson, Jackie D.; Billig, Ernst; and Bryant, David R., to Union Carbide Corporation. Preparation of rhodium complex compounds. 4,446,074, Cl. 260-429.00R.

Janauer, Gilbert E.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,446,103, Cl. 422-37.000.

Janome Sewing Machine Co., Ltd.: *See*—
Ebata, Yoshikazu, 4,445,450, Cl. 112-155.000.

Janssen Pharmaceutica N.V.: *See*—
De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,446,238, Cl. 436-527.000.
Van Bever, Willem F. M., 4,446,145, Cl. 424-273.00R.

Janzen, Harlo W.; and Kliewer, Melvin J., to Kliewer, Larry D.; and Kliewer, Glenn A. Power tongs. 4,445,403, Cl. 81-57.180.

Japan Bano'k Co., Ltd.: *See*—
Ueno, Hideyuki, 4,445,882, Cl. 493-376.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Jiroumaru, Takashi; and Ito, Mamoru, 4,446,309, Cl. 528-486.000.

Jardine, Kenneth J.; and Holleman, Robert A., to Wyoming Mineral Corporation. Method of increasing the strip coefficient of the strip solution stream in a reductive stripping uranium recovery operation. 4,446,114, Cl. 423-10.000.

Jarosek, James P. Tandem hitch apparatus. 4,445,706, Cl. 280-411.00C.

Jarvinen, Willard B., to General Electric Company. Circuitry for sine wave reconstruction. 4,446,512, Cl. 363-39.000.

Jax Products Inc.: *See*—
Frost, John W., 4,445,495, Cl. 126-24.000.

Jayaram, Hiremagalur N.: *See*—
Marquez, Victor E.; Cooney, David A.; Gebeyehu, Gulilat; and Jayaram, Hiremagalur N., 4,446,315, Cl. 536-27.000.

Jean Walterscheid GmbH: *See*—
Entrup, Hubert G., 4,445,876, Cl. 464-48.000.

Jenkins, Albert M.: *See*—
Golub, Gregory J.; and Jenkins, Albert M., 4,446,343, Cl. 200-11.0TC.

Jenq, Cheng-Yih: *See*—
Huibers, Derk T. A.; and Jenq, Cheng-Yih, 4,446,070, Cl. 260-369.000.

Jensen, Marvin E., to Hollister Incorporated. Fecal incontinence device with separable release sheets. 4,445,898, Cl. 604-337.000.

Jezo, Mairice L. J.: *See*—
LeGrand, Jesse S.; Fockler, William; and Jezo, Mairice L. J., 4,446,464, Cl. 343-399.000.

Jidosha Kiki Co., Ltd.: *See*—
Ohsaki, Hiroshi; and Ohe, Takeshi, 4,445,818, Cl. 417-288.000.

Jiroumaru, Takashi; and Ito, Mamoru, to Japan Synthetic Rubber Co., Ltd. Method and apparatus for continuously coagulating a rubbery polymer latex. 4,446,309, Cl. 528-486.000.

Jo, Souk H.: *See*—
Onishi, Sigeru; and Jo, Souk H., 4,445,468, Cl. 123-73.00C.

Johannessen, R. L. Water collecting device. 4,445,247, Cl. 15-98.000.

Johansson, Kjell; and Duarte-Martins, Hermino, Jr., to Landstingens Inkopscentral, LIC. Bone aligning apparatus. 4,445,506, Cl. 128-84.00R.

Johnson, Allan P., to Honeywell Inc. Dither system for a spring mass system. 4,445,779, Cl. 356-350.000.

Johnson, Clifford C., to American Hospital Supply Corporation. Apparatus for photo-curing of dental restorative materials. 4,445,858, Cl. 433-141.000.

Johnson, Fred D.; Flasza, Michael D.; and Tzakis, George J., to Zenith Radio Corporation. Amplifier having reduced power dissipation and improved slew rate. 4,446,443, Cl. 330-257.000.

Johnson, Lonnie G. Temperature responsive automatic sprinkler control. 4,445,642, Cl. 239-64.000.

Johnson, Peter D.; and Silverstein, Seth D., to General Electric Company. High intensity discharge lamp with infrared reflecting means for improving efficacy. 4,446,397, Cl. 313-25.000.

Johnson, Ronald E.: *See*—
Ford, Clarence E., Jr.; and Johnson, Ronald E., 4,445,432, Cl. 101-152.000.

Johnson, William L.: *See*—
Williams, Arthur R.; and Johnson, William L., 4,446,568, Cl. 378-3.000.

Jordan, Robert E., to Cutter Laboratories, Inc. Antithrombin-heparin complex and method for its production. 4,446,126, Cl. 424-183.000.

Jordan, Robert E., to Cutter Laboratories, Inc. Fractionation of heparin. 4,446,314, Cl. 536-21.000.

Jordan, William D.; Hinshaw, Howard G.; and Clemens, Donald L., to Thermalloy Incorporated. Mounting means with solderable studs. 4,446,504, Cl. 361-386.000.

Jowa: *See*—
Borel, Pierre, 4,445,710, Cl. 281-45.000.

Joy Manufacturing Company: *See*—
Ingalls, Robert A., 4,445,831, Cl. 418-201.000.

Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlind, William, to Monsanto Company. Composition containing reaction products of metal oxides and salts with phosphorus compounds. 4,446,061, Cl. 252-602.000.

Judkins, Milton W. Wedge-type concrete insert. 4,445,303, Cl. 52-98.000.

Juelke, Charles V.: *See*—
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,446,062, Cl. 252-609.000.

Juillard, Yves; and Varloud, Christian, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Device for winding a piece of fabric under constant tension, especially for a weaving loom. 4,445,545, Cl. 139-311.000.

Julie, Patricia. Animal pet porch and container. 4,445,459, Cl. 119-1.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,445,726, Cl. 308-3.800.

Kabasin, Daniel F.: *See*—
Stoltman, Donald D.; Kabasin, Daniel F.; and Field, Martin J., 4,445,369, Cl. 73-204.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Shida, Masaharu; Ueda, Makoto; Torisawa, Akira; Owada, Shuji; and Mandai, Masaaki, 4,445,784, Cl. 368-157.000.

Kabushiki Kaisha Fujikoshi t/a Nachi-Rujikoshi Corp.: *See*—
Ohwada, Kunio, 4,445,413, Cl. 83-676.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.

Kabushiki Kaisha Meidensha: *See*—
Kashimoto, Yutaka; Sakuma, Shinzo; and Umeya, Eiji, 4,446,346, Cl. 200-144.00B.
Seo, Toshiya, 4,446,551, Cl. 370-16.000.

Kahara, Toshiki: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.

Kaiser Steel Corporation: *See*—
Powers, Joseph E.; Grimoldi, Ranaldo H.; Williamson, Calvin C.; and Bottini, Alfred A., 4,445,357, Cl. 72-399.000.

Kaji, Isao: *See*—
Takaoka, Michio; Ono, Motoyuki; Kaji, Isao; and Yagi, Shigeki, 4,446,331, Cl. 174-73.00R.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szbao, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, 4,446,139, Cl. 424-256.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Beier, Stefan, 4,446,456, Cl. 340-706.000.
Hoffmeister, Jurgen; Ravasini, Guiseppe; and Boeckh, Franz-Xaver, 4,445,859, Cl. 433-79.000.

Kamath, Venkatesh: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.

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Orimoto, Akira; and Kamei, Kazuo, 4,446,495, Cl. 360-74.100.

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Kanno, Takeo: *See*—
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Kao Soap Co., Ltd.: *See*—
Yamasaki, Harumasa; and Harada, Shoichiro, 4,446,261, Cl. 524-40.000.
Karapita, Alexander D. Adjustable suspension support. 4,445,660, Cl. 248-335.000.
Karino, Kimiji; Kosuge, Tokuo; and Souma, Masahiro, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Carburetor with starting system. 4,446,080, Cl. 261-39.00D.
Karr, Gerald W.; and Wong, George H., to Beloit Corporation. Apparatus and method for starting successive leading ends on travelling web in a winder. 4,445,646, Cl. 242-56.00R.
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Saho, Norihide; Koibuchi, Koji; Kasai, Kenjiro; and Higaki, Hiroshi, 4,445,569, Cl. 165-165.000.
Kashimoto, Yutaka; Sakuma, Shinzo; and Umeya, Eiji, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,446,346, Cl. 200-144.00B.
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Nakamizo, Nobuhiro; Ohuse, Hiroyuki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,446,141, Cl. 424-267.000.
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Yaotani, Kouichi; and Ogawa, Yasuyuki, 4,445,721, Cl. 296-154.000.
Kato, Hideaki; and Handa, Hideyuki, to Konishiroku Photo Industry Co., Ltd. Electrophotographically information recording method. 4,446,472, Cl. 346-153.100.
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Hayashi, Kenji; and Kato, Kiyoshi, 4,445,820, Cl. 417-366.000.
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Katz, Carlos; and Zidon, Amicam C., to Cable Technology Laboratories, Inc. Method for manufacturing heat shrinkable tubing. 4,446,095, Cl. 264-558.000.
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Kaufman, Harold R.: *See*—
Cuomo, Jerome J.; Harper, James M. E.; and Kaufman, Harold R., 4,446,403, Cl. 315-111.810.
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Security paper with authenticity features. 4,446,204, Cl. 428-323.000.
Kaun, Thomas D., to United States of America, Energy. Electrochemical cell. 4,446,212, Cl. 429-103.000.
Kawagoe, Michio: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.
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Kawaguchi, Masashi: *See*—
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Tanouchi, Tadao; Shigeoka, Satoshi; Kawamura, Masanori; Hayashi, Masaki; Terashima, Hiroshi; and Hirata, Fumio, 4,446,143, Cl. 424-270.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Niwa, Senji; Sasaki, Takuji; Shinto, Masaaki; and Imamura, Noriaki, 4,446,250, Cl. 502-309.000.
Kawazoe, Mitsuo, to Olympus Optical Company Ltd. Focus detecting camera. 4,445,767, Cl. 354-195.100.
Kearby, Ronald S.: *See*—
Smith, Burl L.; and Kearby, Ronald S., 4,446,167, Cl. 426-650.000.
Kearney, Frank W., to United States of America, Army. Optoelectronic weld evaluation system. 4,446,354, Cl. 219-130.010.
Keefe, John. Universal programmable lock installation device. 4,445,277, Cl. 33-197.000.
Keiltex Corporation: *See*—
Witt, Fritz K., 4,445,346, Cl. 68-178.000.
Keith, Garland B. Method and apparatus for cutting continuous fibrous material. 4,445,408, Cl. 83-37.000.
Keller, Viktor R.: *See*—
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Kelly, John W., to Haskel, Incorporated. Method for installing tubes in a tube sheet. 4,445,261, Cl. 29-157.400.
Kelsey Hayes Company: *See*—
Sivulka, Gerald M., 4,445,725, Cl. 303-6.00C.
Kendall Company, The: *See*—
Patel, Bhupendra C., 4,445,890, Cl. 604-103.000.
Patel, Bhupendra C., 4,445,891, Cl. 604-103.000.
Kenmar Export Ltd.: *See*—
Evans, Richard F., 4,445,697, Cl. 279-1.00A.
Kenmochi, Takeji, to Kohtaki & Co., Ltd. Pressure cylinder apparatus and hydraulic press incorporating the same. 4,445,840, Cl. 425-450.100.
Kennecott Corporation: *See*—
Barshter, Dennis W., 4,446,357, Cl. 219-275.000.
Kennedy, Donald E.: *See*—
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,446,173, Cl. 427-206.000.
Kennedy, Garth R.: *See*—
Dworsky, Lawrence N.; and Kennedy, Garth R., 4,446,432, Cl. 324-71.500.
Kenrod Enterprises: *See*—
Stubbs, Kenneth W., 4,446,016, Cl. 210-86.000.
Keogh, Michael J., to Union Carbide Corporation. Compositions based on a polysiloxane and an organo titanate and the use thereof in the preparation of water curable, silane modified alkylene-alkyl acrylate copolymers. 4,446,279, Cl. 525-106.000.
Kergreis, Gilbert F.: *See*—
Ribaud, Yves J.; and Kergreis, Gilbert F., 4,445,816, Cl. 415-181.000.
Kerlin, Jack H. Unbalance compensator control. 4,445,398, Cl. 74-573.00R.
Kernforschungsanlage Julich GmbH: *See*—
Divisek, Jiri; and Schmitz, Heinz, 4,445,994, Cl. 204-258.000.
Kerns, Matthew T.: *See*—
Calabrese, Donald P.; Kerns, Matthew T.; and Quinn, Dennis M., 4,446,097, Cl. 376-256.000.
Kerr, Howard A.: *See*—
Bethel, Leslie D.; Kerr, Howard A.; Strebendt, Frances B.; and Waninski, John E., Jr., 4,446,336, Cl. 179-6.100.
Kesaler, Bayard F., to Novation, Inc. Flexible acoustic coupler. 4,446,333, Cl. 179-2.00C.
Kettenbach, Helmuth: *See*—
Deeg, Reinhard; Galaske, Folker; and Kettenbach, Helmuth, 4,445,647, Cl. 242-68.400.
Keve, Tibor: *See*—
Szantay, Csaba; Szbao, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, 4,446,139, Cl. 424-256.000.
Khakimov, Tamerlan G.: *See*—
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.
Kiczek, Casimir R. Popcorn popper. 4,445,427, Cl. 99-323.500.
Kiesewetter, Wolfgang: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.
Kifune, Koji, to Unitika, Ltd. Insulin releasing supplier. 4,445,885, Cl. 604-28.000.
Kikuchi, Hideo; and Kaneko, Tamaki, to Ricoh Company, Ltd. Sheet distribution method. 4,445,680, Cl. 271-290.000.
Kilday, Glen W., Sr. Fireplace heating unit. 4,445,497, Cl. 126-121.000.
Kim, Bang M.; and Weininger, Joseph L., to General Electric Company. Electrolytic reactor for cleaning wastewater. 4,445,990, Cl. 204-151.000.
Kim, Dong K.: *See*—
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., 4,446,198, Cl. 428-625.000.
Kimberly-Clark Corporation: *See*—
Roeder, Robert J., 4,445,900, Cl. 604-389.000.

Kimizuka, Masanori; and Yamanishi, Yoshio, to Sony Corporation. Tape cassette. 4,445,651, Cl. 242-199.000.
Kimmons, Kenneth T.: *See*—
Gartman, Rayburn L.; Gartman, Donald L.; and Kimmons, Kenneth T., 4,445,630, Cl. 222-464.000.
Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, to Nissan Motor Co., Ltd. Motor vehicle equipped with engine noise emission preventing device. 4,445,584, Cl. 180-69.220.
Kimura, Tetsuo: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.
King, Robert W., to Copeland Corporation. Valve assembly. 4,445,534, Cl. 137-512.300.
Kinsell, Robert C.; and Noe, James C., to Garrett Corporation, The. Heat pump systems for residential use. 4,445,639, Cl. 237-81.000.
Kinzie, Michael R., to Plast-Ad, Inc. Edge lighted article holder. 4,446,508, Cl. 362-31.000.
Kirchhoff, Winfried: *See*—
Gohausen, Hans J.; Kirchhoff, Winfried; Lindener, Jurgen; and Wennemann, Harald, 4,445,983, Cl. 204-35.00N.
Kirkland, Joseph J., to Du Pont de Nemours, E. I., and Company. Field flow fractionation channel. 4,446,015, Cl. 209-155.000.
Kirloskar Oil Engines Limited: *See*—
Rao, Nidadavolu N. N., 4,445,486, Cl. 123-557.000.
Kishi, Noriyuki: *See*—
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,445,482, Cl. 123-489.000.
Kishimoto, Satoru; Atsumi, Masaharu; and Sano, Yoshiaki, to Fujitsu Ten Limited; and Fujitsu Limited. Input protection circuit. 4,446,499, Cl. 361-92.000.
Kishimoto, Shinzo; and Yamamuro, Kiyohiko, to Fuji Photo Film Co., Ltd. Method for processing color photographic light-sensitive material. 4,446,225, Cl. 430-393.000.
Kishishita, Hiroshi: *See*—
Endo, Yoshihiro; Kawaguchi, Masashi; Mizukami, Etsuo; and Kishishita, Hiroshi, 4,446,399, Cl. 313-505.000.
Kisiel, Stanley C., III, to Dresser Industries, Inc. Compression end pipe coupling for plastic pipe. 4,445,714, Cl. 285-23.000.
Kisslinger, Walter: *See*—
Aufderhaar, Erhard; Feller, Johannes; Hultsch, Gunther; and Kisslinger, Walter, 4,446,021, Cl. 210-378.000.
Kitaura, Ichiro, to AIOI Seiki Kabushiki Kaisha. Work-clamping unit for use in machine tools. 4,445,675, Cl. 269-20.000.
Kizitani, Izumi: *See*—
Takakuwa, Eiji; Nakano, Kazumi; and Kizitani, Izumi, 4,445,479, Cl. 123-425.000.
Klein, Paul E. Positive release face-bow/mouth-bow mechanism. 4,445,853, Cl. 433-5.000.
Kleiner, Gersh I.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., 4,446,316, Cl. 536-112.000.
Klempirik, Victor L. Wood splitting tool. 4,445,555, Cl. 144-193.00D.
Klepacki, Michael A. Denture support system and method. 4,445,861, Cl. 433-181.000.
Kliewer, Glenn A.: *See*—
Janzen, Harlo W.; and Kliewer, Melvin J., 4,445,403, Cl. 81-57.180.
Kliewer, Larry D.: *See*—
Janzen, Harlo W.; and Kliewer, Melvin J., 4,445,403, Cl. 81-57.180.
Kliewer, Melvin J.: *See*—
Janzen, Harlo W.; and Kliewer, Melvin J., 4,445,403, Cl. 81-57.180.
Klima, Frank J. Rotary drill bit ball plug. 4,445,791, Cl. 384-96.000.
Klinksiek, Bernd: *See*—
Bucheler, Manfred; Klinksiek, Bernd; Gehringer, Hans; and Schnoring, Hildegard, 4,446,127, Cl. 424-59.000.
Kloosterboer, Johan G.: *See*—
Lippits, Gerardus J. M.; Kloosterboer, Johan G.; and Melis, Godefridus, 4,446,549, Cl. 369-275.000.
Klose, Karl W.; and Benjamin, Gary H., to Cooper Tire & Rubber Company. Belt-tread stock assembly drum. 4,445,963, Cl. 156-420.000.
Klugman, Alfred: *See*—
Labour, Donald; Cannon, James R.; and Klugman, Alfred, 4,445,505, Cl. 128-80.00C.
KMW-Mekan AB: *See*—
Malmstrom, Per-Ove; and Dyren, Karl E. A., 4,445,814, Cl. 414-295.000.
Knecht, Todd: *See*—
Elliott, Thomas; and Knecht, Todd, 4,445,313, Cl. 56-16.400.
Knieps, Reinhard: *See*—
Eiglmeier, Kurt; and Knieps, Reinhard, 4,446,075, Cl. 260-465.00G.
Knight, Kerry G., to Borg-Warner Corporation. Clutch driven plate assembly. 4,445,607, Cl. 192-107.00C.
Knight, Raymond J.; Mitten, Robert T.; and Ripley, Robert L., to Philip Morris Incorporated. Cigarette detection and rejection device. 4,445,520, Cl. 131-282.000.
Knors, Herbert: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, to Toyo Kogyo Co., Ltd. Air-fuel mixture control for automobile engine having fuel injection system. 4,445,489, Cl. 123-571.000.
Kobayashi, Kazuo: *See*—
Sakamoto, Koji; and Kobayashi, Kazuo, 4,445,771, Cl. 355-3.0DD.
Kobayashi, Shigenobu: *See*—
Minemura, Norihiro; and Kobayashi, Shigenobu, 4,445,903, Cl. 8-492.000.
Kocourek, Jan: *See*—
Filka, Karel; Coupek, Jiri; and Kocourek, Jan, 4,446,275, Cl. 525-54.100.
Koda, Andrew. Method and apparatus for supporting a vertical cylinder of wet cement surrounding a vertical pipe passing through a horizontal concrete slab. 4,445,304, Cl. 52-127.300.
Kodera, Toshihiko: *See*—
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, 4,446,347, Cl. 200-144.00R.
Koehler, Paul G.; Leahy, Thomas P.; and Lichliter, Thomas P., to AT&T Technologies, Inc. Methods of and apparatus for detecting, measuring, and classifying insulation defects. 4,446,422, Cl. 324-54.000.
Koeijmans, Gerard D.: *See*—
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,446,537, Cl. 367-15.000.
Koenig & Bauer/Egenolf Machine, Inc.: *See*—
Lucas, Anton V., 4,445,407, Cl. 83-27.000.
Koenn, Lawrence D.; and Drude, David B., to Dresser Industries, Inc. Method and apparatus for neutron induced gamma ray well logging. 4,446,368, Cl. 250-262.000.
Koepf, Gerhard A., to United States of America, National Aeronautics and Space Administration. Off-axis coherently pumped laser. 4,446,556, Cl. 372-4.000.
Koepke, Jeffery W.: *See*—
Hsieh, Wen-Ching; Bostich, June M.; and Koepke, Jeffery W., 4,446,036, Cl. 252-8.55D.
Koeppen, Peter L.: *See*—
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,446,514, Cl. 364-200.000.
Kohtaki & Co., Ltd.: *See*—
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Koibuchi, Koji: *See*—
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Kojima, Tadashi; and Todokoro, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal copy device for digital record/reproduction system. 4,446,489, Cl. 360-13.000.
Kojima, Tadashi: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,446,490, Cl. 360-32.000.
Kolbe, Joachim; Kortmann, Wilfried; and Pfeiffer, Josef, to Bayer Aktiengesellschaft. Textile-treatment agents, and their use for finishing textile materials. 4,446,034, Cl. 252-8.800.
Kolling, Byron M.; Bergbreiter, Jack; and Hunn, Roy. Molded trash container cover. 4,445,623, Cl. 220-343.000.
Kolonics, Zoltan: *See*—
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.
Kolycheck, Edmond G.; and Tolle, Laura L., to B. F. Goodrich Company, The. Electron beam curable polyrethane compositions. 4,446,286, Cl. 525-455.000.
Komatsu, Osamu: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Ichihara, Kenzi; and Morishima, Takashi, 4,446,325, Cl. 546-283.000.
Komorin, Leonid V.: *See*—
Ivanov, Andrei S.; Komorin, Leonid V.; Nikishkin, Vladimir I.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,446,374, Cl. 250-492.300.
Komoto, Shinsuke. Reflex zoom lens barrel. 4,445,756, Cl. 350-429.000.
Kondo, Masayuki: *See*—
Nakae, Hiroyuki; Noguchi, Isamu; and Kondo, Masayuki, 4,446,254, Cl. 521-92.000.
Kondo, Yoshikazu: *See*—
Kanda, Katsumi; Kunimoto, Katsunobu; Yamane, Keiji; and Kondo, Yoshikazu, 4,445,998, Cl. 264-385.000.
Kondou, Kouichi: *See*—
Mitsumori, Mitsugi; Hosaka, Hiroaki; Sato, Hiroshi; and Kondou, Kouichi, 4,445,614, Cl. 206-599.000.
Konig, Eberhard; Thoma, Wilhelm; Pedain, Josef; and Konig, Klaus, to Bayer Aktiengesellschaft. Low-solvent, thermosetting reactive polyurethane coating composition, a process for its production and its use in direct and reverse coating processes. 4,446,293, Cl. 528-45.000.
Konig, Joachim; Schnalke, Karl-Erwin; Suling, Carlhans; and Horacek: Gotz, to Bayer Aktiengesellschaft. Process for the continuous production of acrylonitrile-vinyl chloride copolymers. 4,446,291, Cl. 526-209.000.
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Konig, Eberhard; Thoma, Wilhelm; Pedain, Josef; and Konig, Klaus, 4,446,293, Cl. 528-45.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Honda, Chika; Iwata, Masatoshi; and Koitabashi, Takeo, 4,446,228, Cl. 430-567.000.
Kato, Hideaki; and Handa, Hideyuki, 4,446,472, Cl. 346-153.100.
Yamashita, Kiyoshi; and Iijima, Toshifumi, 4,446,226, Cl. 430-506.000.
Kono, Mitsutsugu; and Inoue, Osamu, to Bridgestone Tire Company Limited. Large size pneumatic rubber tire for rough roads. 4,445,561, Cl. 152-209.00B.

Konrad, William L.: *See—*
Moffett, Mark B.; and Konrad, William L., 4,445,361, Cl. 73-1.0DV.

Kooijmans, Petrus G.; and Kunze, Wolfgang, to Shell Oil Company. Aqueous coating powder suspensions and their preparation. 4,446,257, Cl. 523-403.000.

Koomey, Inc.: *See—*
Olejak, Ingo W. V., 4,445,255, Cl. 24-284.000.

Koppers Company, Inc.: *See—*
Cain, George R., 4,445,628, Cl. 222-66.000.

Korach, Malcolm, to PPG Industries, Inc. Electro organic method and apparatus for carrying out same. 4,445,985, Cl. 204-72.000.

Kordel, Gerhard: *See—*
Brede, Uwe; and Kordel, Gerhard, 4,445,434, Cl. 102-206.000.

Kortmann, Wilfried: *See—*
Kolbe, Joachim; Kortmann, Wilfried; and Pfeiffer, Josef, 4,446,034, Cl. 252-8.800.

Koschinek, Gunter; Wandel, Dietmar; Kretschmann, Bernd; and Zinsser, Rolf, to Davy McKee Aktiengesellschaft. Melt spinning of synthetic fibers. 4,446,299, Cl. 528-272.000.

Kosuda, Hironori; Takada, Masaaki; and Inoue, Hisashi, to Matsui Universal Joint Manufacturing Company. Universal joint. 4,445,875, Cl. 464-14.000.

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Karino, Kimiji; Kosuge, Tokuo; and Souma, Masahiro, 4,446,080, Cl. 261-39.00D.

Kovacs, Joseph, to Baka Manufacturing Company, Inc. Band for anchoring a catheter or other device to the body. 4,445,894, Cl. 604-179.000.

Kovar, Robert F.: *See—*
Adams, Ronald W.; Leunig, Carl V.; and Kovar, Robert F., 4,445,954, Cl. 156-148.000.

Kraemer, John F.: *See—*
Seeney, Charles E.; and Kraemer, John F., 4,445,565, Cl. 164-528.000.

Kraft, Heinrich A.: *See—*
Coleman, John D.; Obst, Donald L.; and Kraft, Heinrich A., 4,445,593, Cl. 187-1.00R.

Kraftwerk Union Aktiengesellschaft: *See—*
Tratz, Herbert; Finckh, Hermann; and Kunstle, Konrad, 4,445,325, Cl. 60-39.182.

Krauss-Maffei Aktiengesellschaft: *See—*
Aufderhaar, Erhard; Feller, Johannes; Hultsch, Gunther; and Kisslinger, Walter, 4,446,021, Cl. 210-378.000.

Krebs & Cie S.A.: *See—*
Beutier, Didier; Palvadeau, Claude; Pasquier, Gilles; and Dietrich, March, 4,446,026, Cl. 210-639.000.

Kress, David R., to Matrix Unlimited, Inc. Method of preparing printing surface formed of polymeric resin containing polyamide and dicarboxylic acid diester. 4,446,222, Cl. 430-307.000.

Kretschmann, Bernd: *See—*
Koschinek, Gunter; Wandel, Dietmar; Kretschmann, Bernd; and Zinsser, Rolf, 4,446,299, Cl. 528-272.000.

Krishnan, Sivaram; and Baron, Arthur L., to Mobay Chemical Corporation. Thermoplastic copolycarbonate from halogen free aromatic diol and halogenated thiodiphenol. 4,446,297, Cl. 528-204.000.

Krismer, Bruno; and Hoppe, Axel, to Hermann C. Starck Bertin; and Uranerzbergbau-GmbH. Process for recovering niobium and/or tantalum compounds from such ores further containing complexes of uranium, thorium, titanium and/or rare earth metals. 4,446,116, Cl. 423-63.000.

Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik: *See—*
Kronseder, Hermann; and Bischkopf, Reiner, 4,445,961, Cl. 156-364.000.

Kronseder, Hermann; and Bischkopf, Reiner, to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik. Labeling apparatus for bottles or the like. 4,445,961, Cl. 156-364.000.

Krumm, Valentin, to Lindauer Dornier Gesellschaft mbH. Leno-selvage forming device. 4,445,544, Cl. 139-54.000.

Krupka, Yaakov; Feldman, Salomon; and Yerushalmi, Shmuel, to Omikron Scientific Ltd. Method and apparatus for evaluating pacer battery status and stimulation effectiveness. 4,445,512, Cl. 128-419.0PT.

Kubic, Nick; Bell, Claude; and Seguin, Serge, to Les Produits Menagers Culinaire (Baie d'Urfe) Inc. Pedal bin. 4,445,619, Cl. 220-263.000.

Kublick, Christian: *See—*
Brajder, Antonio; and Kublick, Christian, 4,446,550, Cl. 370-14.000.

Kubo, Kazuhiro: *See—*
Nakamizo, Nobuhiro; Obase, Hiroyuki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,446,141, Cl. 424-267.000.

Kuchta, George J.: *See—*
Stutz, P. David; and Kuchta, George J., 4,445,993, Cl. 204-213.000.

Kuechli, Gottfried: *See—*
Huguenin, Raymond; and Kuechli, Gottfried, 4,445,256, Cl. 29-25.350.

Kulieke, Frederick C., Jr., to Midland-Ross Corporation. Spring biased rotary railway car coupler carrier. 4,445,618, Cl. 213-61.000.

Kullgren, Dennis R.: *See—*
Hoch, Thomas M.; and Kullgren, Dennis R., 4,446,525, Cl. 364-474.000.

Kumada, Masaharu; and Misumi, Akira, to Hitachi, Ltd. Directly heated oxide cathode and production thereof. 4,446,404, Cl. 313-346.00R.

Kumar, Ashok; Segan, Ellen G.; Bukowski, John M.; and Helgeland, Jon L., to United States of America, Army. Ceramic anodes for corrosion protection. 4,445,989, Cl. 204-147.000.

Kumazawa, Tetsuo: *See—*
Miyadera, Yasuo; Fujioka, Atsushi; Kumazawa, Tetsuo; and Doi Hiroaki, 4,446,191, Cl. 428-245.000.

Kunimoto, Katsunobu: *See—*
Kanda, Katsumi; Kunimoto, Katsunobu; Yamane, Keiji; and Kondo, Yoshikazu, 4,445,998, Cl. 264-385.000.

Kunstle, Konrad: *See—*
Tratz, Herbert; Finckh, Hermann; and Kunstle, Konrad, 4,445,325, Cl. 60-39.182.

Kunze, Wolfgang: *See—*
Kooijmans, Petrus G.; and Kunze, Wolfgang, 4,446,257, Cl. 523-403.000.

Kurafuji, Setsuo, to Fujitsu Limited. MOS Decoder circuit using phase clocking for reducing the power consumption. 4,446,386, Cl. 307-449.000.

Kuraray Co., Ltd.: *See—*
Takamatsu, Hideo; and Minatono, Shobu, 4,446,281, Cl. 525-282.000.

Kure-Jensen, Jens; and Marshall, Robert A., to General Electric Company. Low collapse speed lube oil pumping system for turbomachinery. 4,446,377, Cl. 290-52.000.

Kureha Gosen Kabushiki Kaisha: *See—*
Nakamura, Masaaki; and Ueba, Hisaaki, 4,445,964, Cl. 156-500.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.
Nakamura, Masaaki; and Ueba, Hisaaki, 4,445,964, Cl. 156-500.000.

Kurita Machinery Manufacturing Company Limited: *See—*
Kurita, Tetsuya, 4,446,020, Cl. 210-225.000.

Kurita, Tetsuya, to Kurita Machinery Manufacturing Company Limited. Filter press. 4,446,020, Cl. 210-225.000.

Kurtz, Clark N., to Eastman Kodak Company. Luminescent device for high resolution optical address and light valve imaging apparatus employing such device. 4,446,479, Cl. 358-75.000.

Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch Inc. Air purge unit for auto transfusion apparatus. 4,445,884, Cl. 604-4.000.

Kurtz, Rudiger, to Escher Wyss GmbH. Headbox for a papermaking machine. 4,445,975, Cl. 162-336.000.

Kushelman, Vladimir S.: *See—*
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Kusumi, Yuji: *See—*
Fukuda, Kunio; Tazaki, Kichiya; Takano, Akihisa; and Kusumi, Yuji, 4,446,272, Cl. 524-465.000.

Kuwada, Yukio: *See—*
Hachiya, Iwao; Mochizuki, Keizo; and Kuwada, Yukio, 4,446,130, Cl. 424-195.000.

Kuwayama, Masayuki: *See—*
Sekine, Yasuhiro; Kuwayama, Masayuki; and Harada, Hiroshi, 4,446,391, Cl. 310-62.000.

Kuzuya, Kaneharu; Ishida, Giichi; and Ishizaki, Kosho, to Hitachi, Ltd.; and Aisin Seiki Co., Ltd. Stitch pattern setting apparatus for electrically driven sewing machine. 4,445,449, Cl. 112-121.110.

Kwon, Tae M.; and Volk, Charles H., to Litton Systems, Inc. Magnetic resonance cell. 4,446,428, Cl. 324-304.000.

Kzome, Kazuyuki: *See—*
Ishii, Tetsuro; Oyama, Tadanori; Yamashita, Masashi; Kzome, Kazuyuki; Ikeda, Tsutomu; and Fujioka, Satoru, 4,445,981, Cl. 204-18.100.

La Telemecanique Electrique: *See—*
Clenet, Daniel, 4,446,513, Cl. 363-132.000.

Labour, Donald; Cannon, James R.; and Klugman, Alfred. Knee brace for preventing lateral displacement of the patella. 4,445,505, Cl. 128-80.00C.

LaChance, Paul. Combination bracket and adjustable ladder tray. 4,445,659, Cl. 248-210.000.

LaDelfa, Christopher; and Nutter, John F., to Tosco Corporation. Method of entrained flow drying. 4,445,976, Cl. 201-41.000.

Ladusaw, William T., to General Electric Company. Reversible refrigeration system rotary compressor. 4,445,344, Cl. 62-324.600.

Lagarelli, Carmen J., to Speakman Company. Adjustable valve handle. 4,445,529, Cl. 137-360.000.

Lai, Stephen H.: *See—*
Srivastava, Gopal K.; and Lai, Stephen H., 4,446,482, Cl. 358-150.000.

Laing, Inge: *See—*
Laing, Karsten; Laing, Oliver; and Laing, Inge, 4,445,566, Cl. 165-10.000.

Laing, Karsten; Laing, Oliver; and Laing, Inge. Latent heat storage means. 4,445,566, Cl. 165-10.000.

Laing, Oliver: *See—*
Laing, Karsten; Laing, Oliver; and Laing, Inge, 4,445,566, Cl. 165-10.000.

Lake, Norman M. Nasal protective method and device. 4,445,508, Cl. 128-201.180.

Lakin, Charles T.; and Willett, Norman F., to United States of America, Navy. Target for optically activated seekers and trackers. 4,446,363, Cl. 250-203.00R.

Lakisov, Viktor V.: *See—*
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Lam, Chung H.: *See*—
Gaffney, Donald P.; Grise, Gary D.; and Lam, Chung H., 4,446,535, Cl. 365-149.000.
Laminations Corporation: *See*—
Angwin, Richard B., 4,445,693, Cl. 273-404.000.
Lampman, Dewitt W.: *See*—
Bennett, Terry A.; Eilenfeld, Herbert W.; and Lampman, Dewitt W., 4,445,921, Cl. 65-114.000.
Landstingens Inkopscentral, LIC: *See*—
Johansson, Kjell; and Duarte-Martins, Hermino, Jr., 4,445,506, Cl. 128-84.00R.
Lang, Brien R.; and Razzoog, Michael E. Artificial teeth. 4,445,863, Cl. 433-212.000.
Lang, David J.; and Readman, John, to Sundstrand Corporation. Power boost mechanism. 4,445,420, Cl. 91-3.000.
Lange, Daniel J.: *See*—
Mabrey, David W.; Lange, Daniel J.; and Lee, Daniel J., 4,446,300, Cl. 528-288.000.
Lange, Ernst: *See*—
Halene, Clemens; Strack, Karl-Ludwig; Lange, Ernst; and Henrichs, Franz-Josef, 4,446,111, Cl. 422-200.000.
Langmesser, Otto J., Jr.; and Rees, Richard W. A., to General Motors Corporation. Vertical seat adjuster arrangement for vehicle seats. 4,445,661, Cl. 248-394.000.
Langston, Jimmy B.: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,445,889, Cl. 604-49.000.
LaPlante, William J.: *See*—
Boulanger, Henry J.; McGuirk, Andrew C.; and LaPlante, William J., 4,446,450, Cl. 337-380.000.
Lappi, Susan C.; and Maloney, James E., to Economics Laboratory, Inc. Methods of foam inhibition or depression. 4,445,971, Cl. 162-158.000.
Larker, Hans: *See*—
Adlerborn, Jan; Larker, Hans; Mattsson, Bertil; and Nilsson, Jan, 4,446,100, Cl. 419-48.000.
Larner, Joseph; Cheng, Kang; and Galasko, Gail, to University of Virginia Alumni Patents Foundation, The. Insulin mediator substance. 4,446,064, Cl. 260-112.00R.
Larson Enterprises, Inc.: *See*—
Larson, Raymond G., 4,446,506, Cl. 362-17.000.
Larson, Raymond G., to Larson Enterprises, Inc. Photographic light diffuser. 4,446,506, Cl. 362-17.000.
Laserscope, Inc.: *See*—
Hussein, Hany M. G.; Loeb, Marvin P.; and Weiss, Harvey S., 4,445,892, Cl. 604-101.000.
Lauterbach-Dammler, Inge: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, 4,446,561, Cl. 373-93.000.
Lautzenhiser, Theodore V., to Standard Oil Company (Indiana). Gravity meter and method. 4,445,371, Cl. 73-382.00R.
Laxson, Charles F.: *See*—
Nuttall, Brian; and Laxson, Charles F., 4,445,718, Cl. 292-341.170.
Lazar, John D., Jr.; and Shvartsman, Benyamin, to Bemcor, Inc. Apparatus for shearing bars, billets, and other elongated stock. 4,445,410, Cl. 83-390.000.
Lazerson, Max M.: *See*—
Bohme, Rolf C.; and Lazerson, Max M., 4,445,615, Cl. 209-555.000.
Le Silicium Semiconducteur SSC: *See*—
Bacuvier, Pierre, 4,446,478, Cl. 357-75.000.
Leaf, Sallie; and Rubin, Arnold. Umbrella storage tube in automobile dashboard. 4,445,720, Cl. 296-37.120.
Leahy, Thomas P.: *See*—
Koehler, Paul G.; Leahy, Thomas P.; and Lichliter, Thomas P., 4,446,422, Cl. 324-54.000.
Leco Corporation: *See*—
Atwell, William L., 4,445,390, Cl. 73-864.520.
Lee, Charles E.; and Combs, C. Marlon, to Dynametric, Inc. Telephone signal recording methods and apparatus. 4,446,335, Cl. 179-2.00C.
Lee, Daniel J.: *See*—
Mabrey, David W.; Lange, Daniel J.; and Lee, Daniel J., 4,446,300, Cl. 528-288.000.
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., to FMC Corporation. Mixed phenyl/mesityl phosphate ester composition. 4,446,062, Cl. 252-609.000.
Lee, Garland G., to General Electric Company. Compositions. 4,446,268, Cl. 524-315.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Transition metal aluminates supported on a substrate. 4,446,201, Cl. 428-696.000.
Lee, Kung-You; McMahon, Matthew A.; and Powell, Justin C., to Texaco Inc. Apparatus and method for the manufacture of gas filters. 4,446,057, Cl. 502-355.000.
Lee, Man S.: *See*—
Chang, Chieh; and Lee, Man S., 4,446,438, Cl. 328-127.000.
Lee-Norse Company: *See*—
Goyarts, Wynand M., 4,445,663, Cl. 248-652.000.
Leeper, Harold M.: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,445,889, Cl. 604-49.000.
Le Feuvre, Camille: *See*—
Schwind, Jacques; and Le Feuvre, Camille, 4,446,099, Cl. 376-277.000.
Leggett & Platt, Incorporated: *See*—
Aronson, Terry L., 4,445,547, Cl. 140-92.300.
LeGrand, Jesse S.; Fockler, William; and Jezo, Mairice L. J., to International Telephone and Telegraph Corporation. Airborne tacan equipment utilizing a logarithmic amplifier. 4,446,464, Cl. 343-399.000.
Lehikoinen, Keijo; and Nevalainen, Kyosti, to Oy Wartsila Ab. Arrangement in doors. 4,445,299, Cl. 49-167.000.
Lehman, James A. Spring powered saucer with launching tab and platform. 4,445,296, Cl. 46-74.00D.
Leigh Products, Inc.: *See*—
Imhoff, William B., 4,445,717, Cl. 292-177.000.
Leimbach, Richard C., to Eaton Corporation. Valve extension. 4,445,527, Cl. 137-226.000.
Leitch, James K.; Newman, Raymond C.; and Gray, Cameron B. Stand and strap arrangement for supporting and securing pipes. 4,445,656, Cl. 248-49.000.
Lemke, Walter G. Device for destroying hypodermic needles and syringes. 4,445,644, Cl. 241-99.000.
Lenderking, Bruce N.: *See*—
Emery, Franklin T.; Lenderking, Bruce N.; and Couch, Robert D., 4,446,426, Cl. 324-158.0MG.
Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab): *See*—
von Daehne, Welf, 4,446,144, Cl. 424-270.000.
Leonard, Don R.: *See*—
Belote, Stephen N.; Leonard, Don R.; and Luce, Garrett C., 4,446,301, Cl. 528-295.300.
Les Produits Menagers Culinaire (Baie d'Urfe) Inc.: *See*—
Kubic, Nick; Bell, Claude; and Seguin, Serge, 4,445,619, Cl. 220-263.000.
Leslie, Kenneth A., to Procter & Gamble Company, The. Brightener for detergents containing nonionic and cationic surfactants. 4,446,042, Cl. 252-102.000.
Leuenberger, Hans: *See*—
Eggli, Daniele; von Ow, Dieter; and Huni, Gregor, 4,445,518, Cl. 128-783.000.
Leunig, Carl V.: *See*—
Adams, Ronald W.; Leunig, Carl V.; and Kovar, Robert F., 4,445,954, Cl. 156-148.000.
Leuven Research and Development V.Z.W.: *See*—
Van Brussel, Hendrik M.; and Simons, Joseph A. G., 4,445,273, Cl. 29-714.000.
Leven, Jakob: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Ros.n, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.
Lever Brothers Company: *See*—
Beavan, Stuart W.; and Willis, Edwin, 4,445,901, Cl. 8-103.000.
Berthod, Daniel P. M.; and Ferret, Simone, 4,446,051, Cl. 252-309.000.
Tai, Ho T., 4,446,043, Cl. 252-105.000.
Levine, Lewis J.; and Shipp, Kenneth O., Jr., to International Business Machines. Method and apparatus for merge processing in a text processing system. 4,445,795, Cl. 400-63.000.
Levine, Stanley R.: *See*—
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,446,199, Cl. 428-639.000.
Levinson, Vladimir A.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.
Levral, Roland: *See*—
Carre, Jean-Jacques; and Levral, Roland, 4,445,263, Cl. 29-445.000.
LiCausi, Joseph: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,445,884, Cl. 604-4.000.
Lichliter, Thomas P.: *See*—
Koehler, Paul G.; Leahy, Thomas P.; and Lichliter, Thomas P., 4,446,422, Cl. 324-54.000.
Life Technologies, Inc.: *See*—
Berninger, Mark S., 4,446,237, Cl. 436-504.000.
Likhyani, Kewal K.: *See*—
Baker, Richard A.; Forsythe, George D.; Likhyani, Kewal K.; Roberts, Robert E.; and Robertson, David C., 4,446,024, Cl. 210-500.200.
Lin, Cheng-I; and Singh, Prithipal, to Syva Company. Phencyclidine compounds and assays for its determination. 4,446,065, Cl. 260-112.00R.
Lind, David J.; and Richards, Joyce, to Rolls-Royce Limited. Method of manufacturing composite materials. 4,445,951, Cl. 156-93.000.
Lind, Leif, to F. L. Smidth & Co. Method of controlling operation of an electrostatic precipitator. 4,445,911, Cl. 55-2.000.
Lindauer Dornier Gesellschaft mbH: *See*—
Krumm, Valentin, 4,445,544, Cl. 139-54.000.
Lindauer, Jerome I.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,446,032, Cl. 252-8.600.
Lindener, Jurgen: *See*—
Gohausen, Hans J.; Kirchhoff, Winfried; Lindener, Jurgen; and Wennemann, Harald, 4,445,983, Cl. 204-35.00N.
Lindner, Christian: *See*—
Binsack, Rudolf; Lindner, Christian; Rempel, Dieter; and Ott, Karl-Heinz, 4,446,276, Cl. 525-64.000.
Linear Dynamics, Inc.: *See*—
Willis, John G., 4,445,536, Cl. 137-560.000.

Linev, Valery D.: *See*—
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Link, Donald A.; and Swessel, John A., Jr., to Eaton Corporation. Electrical panelboard with main breaker hold-down. 4,446,503, Cl. 361-346.000.

Linke, Horst; Albers, Josef; and Erwien, Helmut, to Gewerkschaft Eisenhutte Westfalia. Chain stripper devices and assemblies for mining machines. 4,445,878, Cl. 474-92.000.

Liotta, Lance A. Enzyme immunoassay with two-zoned device having bound antigens. 4,446,232, Cl. 435-7.000.

Liotta, Lance A.: *See*—
Russo, Raimondo; and Liotta, Lance A., 4,446,234, Cl. 435-29.000.

Lipe Rollway Corporation: *See*—
Schmidt, Frederick C., 4,445,600, Cl. 192-18.00R.

Lippits, Gerardus J. M.; Kloosterboer, Johan G.; and Melis, Godefridus, to U.S. Philips Corporation. Optically readable information disc and method of manufacturing same. 4,446,549, Cl. 369-275.000.

Lisica, Vincent M.; and Ross, Charles O., to International Business Machines Corporation. Print electrode control circuit. 4,445,796, Cl. 400-120.000.

List, David E., to Tioxide Group Limited. Sewage treatment composition its manufacture and use. 4,446,031, Cl. 252-1.000.

Litrico, Biagio. Marine life traps. 4,445,295, Cl. 43-102.000.

Litton Systems, Inc.: *See*—
Kwon, Tae M.; and Volk, Charles H., 4,446,428, Cl. 324-304.000.

Loch, Joseph. Hydrofoil assembly. 4,445,452, Cl. 114-282.000.

Lockheed Electronics Co., Inc.: *See*—
Rawicz, Harris C.; Rizzo, Vincent J.; and Buntemeyer, William R., 4,446,409, Cl. 318-632.000.

Loeb, Marvin P.: *See*—
Hussein, Hany M. G.; Loeb, Marvin P.; and Weiss, Harvey S., 4,445,892, Cl. 604-101.000.

Lohrmann, Gerhard: *See*—
Babsch, Alfred; and Lohrmann, Gerhard, 4,446,367, Cl. 250-231.05E.

Long, William B.; Metzger, Donald L.; and Shuey, John R., to AMP Incorporated. Electrical distribution system for lights and connectors therefor. 4,445,737, Cl. 339-18.00C.

Long, William B.; and Shannon, Suel G., to AMP Incorporated. Electrical connector for interconnecting printed circuit boards. 4,446,505, Cl. 361-413.000.

Long, William E., to Ciba-Geigy AG. Dyestuffs and their use in photographic material. 4,446,227, Cl. 430-513.000.

Long, William E.: *See*—
Smith, Norman A.; Postle, Stephen R.; and Long, William E., 4,446,216, Cl. 430-405.000.

Longenecker, Bruce A. Window assembly including a storable fire escape. 4,445,589, Cl. 182-76.000.

L'Oreal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,445,521, Cl. 132-7.000.

Loucks, George R., to General Electric Company. Polyphenylene oxide blends. 4,446,278, Cl. 525-92.000.

Loshio, Ilmari, to Oy Partek AB. Hydraulic motor. 4,445,423, Cl. 91-492.000.

Lo v, Bjorn, to Aktiebolaget S:t Eriks Betong. System of prefabricated concrete elements for constructing paths. 4,445,802, Cl. 404-40.000.

Love, Michael; and Forman, Philip. Adjustable length drive belt for vehicle belt pulley system. 4,445,877, Cl. 474-255.000.

Lovenguth, Ronald F.: *See*—
Braksmayer, Dixa P.; and Lovenguth, Ronald F., 4,446,265, Cl. 524-139.000.

Lovgren, Eric M.; Golba, Joseph C., Jr.; and Reed, Randall A., to General Electric Company. High viscosity silicone blending process. 4,446,090, Cl. 264-211.000.

Lovrenich, Rodger T. Measuring and control device using the damping effect of a resistive effect element on the inductor of a tuned circuit. 4,446,427, Cl. 324-207.000.

Lu, Ning K. Surface sweeper. 4,445,245, Cl. 15-23.000.

Lubrizol Corporation, The: *See*—
Pindar, John F.; and Cohen, Jerome M., 4,446,039, Cl. 252-52.00R.

Lucas, Anton V., to Koenig & Bauer/Egenolf Machine, Inc. Method and apparatus for handling book trimmings. 4,445,407, Cl. 83-27.000.

Lucas Industries Limited: *See*—
Baum, Heinz W., 4,445,595, Cl. 188-73.380.

Luce, Garrett C.: *See*—
Belote, Stephen N.; Leonard, Don R.; and Luce, Garrett C., 4,446,301, Cl. 528-295.300.

Luijerink, Jan H., to Internationale Octrooi Maatschappij "Octropa" B.V. Process for the manufacture of globin or blood cell protein and heme from hemoglobin. 4,446,066, Cl. 260-112.00B.

Luk, Kong, to Beecham Group Limited of Beecham House. Process for the preparation of β-lactam antibiotics. 4,446,069, Cl. 260-245.20R.

Lukas-Erzett Vereinigte Schleif und Fraswerkzeugfabriken: *See*—
Theilen, Kurt A., 4,445,810, Cl. 407-118.000.

Lukezich, Paul J.: *See*—
Puccinelli, Joseph S.; and Lukezich, Paul J., 4,445,307, Cl. 52-638.000.

Luksas, Anthony J.: *See*—
Shah, Syed M. M.; Luksas, Anthony J.; and Ahmed, Salah E., 4,446,055, Cl. 252-351.000.

Lundberg, Robert D.; and Thaler, Warren A., to Exxon Research and Engineering Co. Sulfonated polymer and compositions thereof. 4,446,267, Cl. 524-211.000.

Lutfy, Joseph P.; Grabowski, Thaddeus J.; and Arnold, Robert G., to General Motors Corporation. Method of forming composite surface on a dielectric substrate. 4,445,979, Cl. 204-15.000.

Lynn Products Company, Incorporated: *See*—
Cullinane, Daniel, Jr., 4,446,000, Cl. 204-415.000.

Lyon, Harry H., to General Motors Corporation. Internal combustion engine misfire detection system. 4,445,326, Cl. 60-277.000.

M. H. Detrick Company, Limited: *See*—
Harvey, Barrie J.; and Mann, Ian J., 4,446,082, Cl. 264-30.000.

Ma, Tak M.: *See*—
D'Andrade, Bruce M.; Ng, Ping F.; and Ma, Tak M., 4,445,297, Cl. 46-230.000.

Mabrey, David W.; Lange, Daniel J.; and Lee, Daniel J., to P. D. George Company, The. Isocyanurate-type polymers. 4,446,300, Cl. 528-288.000.

Machinefabriek A. Fontijne B.V.: *See*—
Pols, Pieter M., 4,445,352, Cl. 72-101.000.

MacLeod, Richard J.: *See*—
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., 4,445,356, Cl. 72-319.000.

Maeda, Hiroshi; and Nishi, Katsuhide, to Yamanouchi Pharmaceutical Co., Ltd. Agents for improvement of peripheral blood flow. 4,446,136, Cl. 424-177.000.

Maeder, Heinz B.: *See*—
Gercekci, Anil; and Maeder, Heinz B., 4,446,475, Cl. 357-40.000.

Maehl, Ronald C., to RCA Corporation. Extendible tubular booms for remote sensors. 4,446,466, Cl. 343-877.000.

Maejima, Hideo: *See*—
Katsura, Koyo; and Maejima, Hideo, 4,446,517, Cl. 364-200.000.

Maekawa, Masakazu; Nakamura, Sukenori; Sugiyama, Masatoshi; and Odawara, Hideo, to Fuiji Photo Film Company, Ltd. Method of ink-jet recording. 4,446,174, Cl. 427-261.000.

Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,445,726, Cl. 308-3.800.

Magnetic Peripherals Inc.: *See*—
Miller, Christopher, 4,446,546, Cl. 369-45.000.

Mai, Chao C.; Whitney, William M.; Gosney, William M.; and Gulyas, Donald J., to Mostek Corporation. MOSFET Fabrication process for reducing overlap capacitance and lowering interconnect impedance. 4,445,266, Cl. 29-571.000.

Makabe, Takayoshi: *See*—
Edamatsu, Kunihiko; and Makabe, Takayoshi, 4,446,481, Cl. 358-106.000.

Malani, Narayandas; and Boller, Thomas E., to Ford Motor Company. Method of forming a high performance reflective film on a glass sheet. 4,446,172, Cl. 427-160.000.

Malizia, Peter D.; and Trumbetas, Jerome F., to General Foods Corporation. Decaffeination of a coffee extract. 4,446,162, Cl. 426-424.000.

Malmstrom, Per-Ove; and Dyren, Karl E. A., to KMW-Mekan AB. Apparatus for depositing solid particulate material in a frustoconical pile. 4,445,814, Cl. 414-295.000.

Maloney, James E.: *See*—
Lappi, Susan C.; and Maloney, James E., 4,445,971, Cl. 162-158.000.

Mancusi, Fred, to American Motors Corporation. Cargo container with adjustable retaining mechanism. 4,445,616, Cl. 211-13.000.

Mandai, Masaaki: *See*—
Shida, Masaharu; Ueda, Makoto; Torisawa, Akira; Owada, Shuji; and Mandai, Masaaki, 4,445,784, Cl. 368-157.000.

Mandel, Philip: *See*—
Friedman, David; and Mandel, Philip, 4,446,412, Cl. 318-696.000.

Mangood Corporation: *See*—
Caldicott, Jack R., 4,445,581, Cl. 177-163.000.

Mann, Ian J.: *See*—
Harvey, Barrie J.; and Mann, Ian J., 4,446,082, Cl. 264-30.000.

Mannesmann AG: *See*—
Babsch, Alfred; and Lohrmann, Gerhard, 4,446,367, Cl. 250-231.05E.
Halene, Clemens; Strack, Karl-Ludwig; Lange, Ernst; and Henrichs, Franz-Josef, 4,446,111, Cl. 422-200.000.

Mannesmann Veba Umwelttechnik GmbH: *See*—
Riemann, Hanns-Helmut; and Sonnenschein, Hans, 4,445,906, Cl. 44-1.00D.

Margolin, David: *See*—
Margolin, Mark; and Margolin, David, 4,445,632, Cl. 225-2.000.

Margolin, Mark; and Margolin, David, to East-West Precision, Inc. Fiber optic scribe and cleave tool and method. 4,445,632, Cl. 225-2.000.

Margolin, Mark: *See*—
Grois, Igor; Margolin, Mark; and Berg, Alan, 4,445,750, Cl. 350-96.210.

Margulies, Herman, to Sterling Drug Inc. Prepackaged, disposable hypodermic syringes. 4,445,895, Cl. 604-193.000.

Marino, James J., Jr.: *See*—
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,446,173, Cl. 427-206.000.

Marion, Gerard, to Renault Vehicules Industriels. Mechanical fuel injection devices, mainly for diesel engines. 4,445,484, Cl. 123-502.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Rubbery polycarbonates. 4,446,285, Cl. 525-439.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Branched copolycarbonate from triphenol. 4,446,298, Cl. 528-204.000.
Markowski, Stanley J.; and Reilly, Richard S., to United States of America, Navy. Swirler assembly for a vorbix augmentor. 4,445,338, Cl. 60-748.000.
Marley Company: *See*—
Athey, Roderick E.; and Furnish, Alan G., 4,445,537, Cl. 137-572.000.
Marmon, Robert A. Shoppers calculator. 4,446,528, Cl. 364-709.000.
Marquez, Victor E.; Cooney, David A.; Gebeyehu, Gulilat; and Jayaram, Hiremagalur N., to United States of America, Health and Human Services. Adenosine 5'-triphosphate-4-carboxamide-ribofuranosylthiazole. 4,446,315, Cl. 536-27.000.
Marsh, Lee M., Jr.: *See*—
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,446,365, Cl. 250-213.00R.
Marshall, Robert A.: *See*—
Kure-Jensen, Jens; and Marshall, Robert A., 4,446,377, Cl. 290-52.000.
Martin, Fred E., to Remington Arms Company, Inc. Bolt latch for bolt-action firearm. 4,445,292, Cl. 42-16.000.
Martin, Henry W., to T. F. Hudgins & Associates, Inc. Temperature sensor. 4,445,454, Cl. 116-106.000.
Martinez Parra, JoseCalle Salitre 33-1°, Edificio Juan XXIII. System for the generation of electrical energy by utilizing the kinetic energy of seawater. 4,446,378, Cl. 290-54.000.
Marui Ltd.: *See*—
Tange, Michiaki, 4,445,703, Cl. 280-279.000.
Maruko Seiyaku Co., Ltd.: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Ichihara, Kenzi; and Morishima, Takashi, 4,446,325, Cl. 546-283.000.
Maruyama, Hisaichi: *See*—
Shigeta, Katsunori; Nakamura, Takashi; Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,446,520, Cl. 364-400.000.
Massey-Ferguson Services N.V.: *See*—
Yapp, Robert E.; and Smith, Derek J., 4,445,394, Cl. 74-501.00R.
Mastronarde, Thomas P., to Combustion Engineering, Inc. Waste heat boiler with feed mixing nozzle. 4,445,462, Cl. 122-7.00R.
Mathis, Ronald D.; and Reed, Jerry O., to Phillips Petroleum Company. Process for cleaning metal surfaces. 4,445,941, Cl. 134-3.000.
Matrix Unlimited, Inc.: *See*—
Kress, David R., 4,446,222, Cl. 430-307.000.
Matsuda, Shimpei: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Matsuguchi, Michiharu: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,446,273, Cl. 524-556.000.
Matsui, Kazuma: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.
Matsui Universal Joint Manufacturing Company: *See*—
Kosuda, Hironori; Takada, Masaaki; and Inoue, Hisashi, 4,445,875, Cl. 464-14.000.
Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Control of carburetor-supplied induction system. 4,445,473, Cl. 123-308.000.
Matsumoto, Yasuji: *See*—
Shigeta, Katsunori; Nakamura, Takashi; Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,446,520, Cl. 364-400.000.
Matsumura, Shunichi: *See*—
Okumura, Nobuya; Ichihashi, Tetsuo; Matsumura, Shunichi; and Inata, Hiroo, 4,446,262, Cl. 524-89.000.
Matsumura, Susumu, to Canon Kabushiki Kaisha. Light measuring device for a single lens reflex camera. 4,445,764, Cl. 354-480.000.
Matsuo, Tadayuki: *See*—
Mizusaki, Takashi; Matsuo, Tadayuki; Esashi, Masayoshi; and Abe, Hiroshi, 4,446,474, Cl. 357-25.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; and Yamashita, Toshio, 4,446,121, Cl. 423-644.000.
Mizukawa, Takumi; Amagami, Keizo; and Ogino, Yoshio, 4,446,350, Cl. 219-10.770.
Shinohara, Kazuyoshi, 4,445,793, Cl. 384-130.000.
Tsuboka, Eiichi, 4,446,530, Cl. 364-725.000.
Matsushita, Tomiharu: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.
Matsuura, Norio: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,446,273, Cl. 524-556.000.
Matthews, Francis T., to Combustion Engineering, Inc. Liquid fuel and air feed apparatus for fluidized bed boiler. 4,445,844, Cl. 431-170.000.
Mattingly, Owen M. Flame holding lighter for industrial gas-fired ovens. 4,445,846, Cl. 431-352.000.
Mattson, William F., to B. F. Goodrich Company, The. "Piggyback" heat exchanger for dome presses. 4,446,093, Cl. 264-315.000.
Mattsson, Bertil: *See*—
Adlerborn, Jan; Larker, Hans; Mattsson, Bertil; and Nilsson, Jan, 4,446,100, Cl. 419-48.000.
Maughan, Rex G., to Aloe Vera of America, Inc. Controlled temperature process for manufacturing of improved stabilized aloe vera. 4,446,131, Cl. 424-195.000.
Mausezahl, Dieter: *See*—
Schaetzer, Harry; Raisin, Helmut; Mausezahl, Dieter; and Ciba-Geigy AG, 4,445,905, Cl. 8-641.000.
Maxhimer, Monroe R. Swimming pool water level control apparatus. 4,445,238, Cl. 4-508.000.
May, Earl L.; and Baltzer, William W., to PPG Industries, Inc. Auxiliary side heater for a float glass forming chamber. 4,445,924, Cl. 65-182.300.
Mayfield, William B., to Parker-Hannifin Corporation. Medication infusion pump. 4,445,535, Cl. 137-535.000.
Mazur, Joseph S., to Eaton Corporation. Cooling fan control. 4,445,583, Cl. 180-68.100.
McCaleb, George E., to Thermal Specialties Inc. Insulating foam steam stimulation method. 4,445,573, Cl. 166-250.000.
McCallan, Michael G.: *See*—
Comerford, Matthias F.; and McCallan, Michael G., 4,446,358, Cl. 219-388.000.
McCarty, William J., to General Electric Company. Sonic restrictor means for a heat pump system. 4,445,343, Cl. 62-324.100.
McConway & Torley Corporation: *See*—
Elliott, William O., 4,445,617, Cl. 213-60.000.
McCormick Laboratories, Inc.: *See*—
Bresler, Robert G., 4,445,501, Cl. 128-1.500.
McCreary, Charles H., to General Motors Corporation. Engine with speed responsive multi-ratio turbocharger drive. 4,445,337, Cl. 60-608.000.
McDaniel, James W., to Alumina Development Corporation. Double digestion system to reduce formation of ferrous iron. 4,446,117, Cl. 423-121.000.
McDermott, Gertrude D., to Hydra-Jack, Inc. Hydraulic jack device. 4,445,666, Cl. 254-93.00H.
McDonald, William M.: *See*—
Abdallah, Mohamed G.; and McDonald, William M., 4,445,804, Cl. 405-173.000.
McDonie, Arthur F.: *See*—
Faulkner, Richard D.; Thoman, Daniel L.; and McDonie, Arthur F., 4,446,401, Cl. 313-533.000.
McDonnell Douglas Corporation: *See*—
Rodgers, Richard W., 4,446,536, Cl. 365-230.000.
McElroy, Lucian G. Adjustable clamp for fluid stripping bag. 4,445,251, Cl. 15-316.00R.
McGinniss, Vincent D., to Three Bond Co., Ltd. Catalyst systems for two-pack acrylic adhesive formulations. 4,446,246, Cl. 502-155.000.
McGuirk, Andrew C.: *See*—
Boulanger, Henry J.; McGuirk, Andrew C.; and LaPlante, William J., 4,446,450, Cl. 337-380.000.
McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Electrochemical cell having a separator-gas electrode combination. 4,445,986, Cl. 204-98.000.
McKay, Robert A., to Monsanto Company. Double-tuned single coil probe for nuclear magnetic resonance spectrometer. 4,446,431, Cl. 324-318.000.
McKelvey, Harold E., to Shatterproof Glass Corporation. Rotatable sputtering apparatus. 4,445,997, Cl. 204-298.000.
McKeough, David T.: *See*—
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,446,292, Cl. 528-29.000.
McLandrich, Matthew N.; and Albares, Donald J., to United States of America, Navy. Optical resonator single-mode fiber hydrophone. 4,446,543, Cl. 367-149.000.
McMahon, Matthew A.: *See*—
Lee, Kung-You; McMahon, Matthew A.; and Powell, Justin C., 4,446,057, Cl. 502-355.000.
McNamara, David A., to Ford Motor Company. Circuit for converting pressure variation to frequency variation. 4,446,447, Cl. 331-42.000.
McQuade, Paul D. Method of circle mining of ore. 4,445,723, Cl. 299-11.000.
Mead, Howard B., to Shell Research Limited. Flexible hose for liquefied gases. 4,445,543, Cl. 138-122.000.
Measurex Corporation: *See*—
Smith, Vigo N., 4,445,359, Cl. 73-1.00G.
Medical College of Wisconsin: *See*—
Froncisz, Wojciech; and Hyde, James S., 4,446,429, Cl. 324-316.000.
MegaTape Corporation: *See*—
Avra, Raymond E.; and Herrington, Lawrence, 4,445,650, Cl. 242-192.000.
Mehta, Rajesh R.: *See*—
Woods, Richard A.; and Mehta, Rajesh R., 4,446,260, Cl. 523-409.000.
Meiji Seika Kaisha, Ltd.: *See*—
Hachiya, Iwao; Mochizuki, Keizo; and Kuwada, Yukio, 4,446,130, Cl. 424-195.000.
Meixell, Richard D., to General Motors Corporation. Corrosion protector for wheel brake assembly bleeder valve. 4,445,530, Cl. 137-381.000.
Melinat, Wolfgang, to General Motors Corporation. Master cylinder assembly and booster. 4,445,330, Cl. 60-545.000.
Melinat, Wolfgang, to General Motors Corporation. Master cylinder assembly. 4,445,335, Cl. 60-589.000.

Melis, Godefridus: *See*—
Lippits, Gerardus J. M.; Kloosterboer, Johan G.; and Melis, Godefridus, 4,446,549, Cl. 369-275.000.

Mellgren, Per G.: *See*—
Hyde, Bruce; Tyndall, Wayne; Abernethy, Dennis; and Mellgren, Per G., 4,445,552, Cl. 144-3.00D.

Melnikov, Alexandr V.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Menger, Erich: *See*—
Hammerling, Gunter; Muller, Ingo; and Menger, Erich, 4,446,104, Cl. 422-63.000.

Mensa, Raymond J.: *See*—
Whartenby, James C.; Brown, Richard; Rao, Srinivas T.; and Mensa, Raymond J., 4,445,978, Cl. 204-15.000.

Merck & Co., Inc.: *See*—
Angeles, Marshall R., 4,446,076, Cl. 260-465.00G.

Merhav, Shmuel J., to Technion Research and Development Foundation Ltd. Apparatus and method for measuring specific force and angular rate. 4,445,376, Cl. 73-510.000.

Merrell Toraude et Compagnie: *See*—
Gerhart, Fritz; and Van Dorsselaer, Viviane, 4,446,151, Cl. 424-319.000.

Merritt, William H. Baseball bat. 4,445,687, Cl. 273-72.00R.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Schwaerzler, Hans, 4,445,653, Cl. 244-110.00D.
Sepp, Gunther; and Dyrna, Peter, 4,446,558, Cl. 372-64.000.
Wendt, Hans-Joachim, 4,446,524, Cl. 364-463.000.

Messier-Hispano-Bugatti (S.A.): *See*—
Turiot, Andre , 4,445,672, Cl. 267-64.160.

Metal Parts, Inc.: *See*—
Funk, Charles F., 4,445,727, Cl. 308-4.00A.

Metalfab, Inc.: *See*—
Crane, Julius, 4,445,839, Cl. 425-421.000.

Metzger, David A.: *See*—
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,445,912, Cl. 55-283.000.

Metzger, Donald L.: *See*—
Long, William B.; Metzger, Donald L.; and Shuey, John R., 4,445,737, Cl. 339-18.00C.

Meyeroff, Chester. Adjustable window structure. 4,445,563, Cl. 160-369.000.

Meyers, Stuart R., to Synapco Ltd. Footwear sole member. 4,445,283, Cl. 36-29.000.

Mica Corporation, The: *See*—
Patel, Harshad K.; and Illick, Andjelko, 4,446,188, Cl. 428-138.000.

Michels, Geoffrey H., to Indian Head Incorporated. Variable fill fluid coupling with charging liquid collector. 4,445,328, Cl. 60-351.000.

Michishita, Kazuo: *See*—
Suzuki, Go; and Michishita, Kazuo, 4,445,274, Cl. 29-832.000.

Midland-Ross Corporation: *See*—
Kulieke, Frederick C., Jr., 4,445,618, Cl. 213-61.000.

Miesowicz, Frederick M.: *See*—
Auditore-Hargreaves, Karen; and Miesowicz, Frederick M., 4,446,233, Cl. 435-7.000.

Mike Volk Co., Inc., The: *See*—
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,445,912, Cl. 55-283.000.

Miki, Nobuaki; and Yokoyama, Shoji, to Aisin Warner Kabushiki Kaisha. Electromagnetic valve and method for assembly. 4,445,528, Cl. 137-315.000.

Miller, Christopher, to Magnetic Peripherals Inc. Focus initialization system for optical recording. 4,446,546, Cl. 369-45.000.

Miller, Dale E.: *See*—
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,446,434, Cl. 324-363.000.

Miller, Donald; and Bowers, Clark A., to United States of America, Navy. Release mechanism for a cylindrical object recovery device. 4,445,719, Cl. 294-88.000.

Miller, James D. Apparatus for dampening pump pressure pulsations. 4,445,829, Cl. 417-543.000.

Millheim, Keith K., to Standard Oil Company (Indiana). System for measuring downhole drilling forces. 4,445,578, Cl. 175-45.000.

Milliken Research Corporation: *See*—
Satterfield, Larry S., 4,445,322, Cl. 57-264.000.

Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., to Occidental Chemical Co. Process for blending phosphoric acids of differing impurity content. 4,445,926, Cl. 71-34.000.

Milnes, Arthur G., to Carnegie-Mellon University. Method for making thin film cadmium telluride and related semiconductors for solar cells. 4,445,965, Cl. 156-624.000.

Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing method for spun yarns. 4,445,317, Cl. 57-22.000.

Mimori, Teruo: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.

Minatono, Shobu: *See*—
Takamatsu, Hideo; and Minatono, Shobu, 4,446,281, Cl. 525-282.000.

Minemura, Norihiro; and Kobayashi, Shigenobu, to Teijin Limited. Process for the preparation of woven fabrics of low air permeability. 4,445,903, Cl. 8-492.000.

Minnesota Mining and Manufacturing Company: *See*—
Brochman, Wilfred R.; and Patterson, Richard A., 4,445,620, Cl. 220-271.000.
Guenthner, Richard A.; and Stivers, David A., 4,446,270, Cl. 524-433.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishikawa, Norio; and Omaki, Takanobu, 4,445,761, Cl. 354-402.000.

Miranda, Robert E.: *See*—
Reynolds, Frederick W., III; Miranda, Robert E.; and Fabian, Roger C., 4,445,952, Cl. 156-94.000.

Misaizu, Tetsuo, to Nippon Electric Co., Ltd. MOS Inverter-buffer circuit having a small input capacitance. 4,446,387, Cl. 307-450.000.

Mischutin, Vladimir, to White Chemical Corporation. Process for rendering non-thermoplastic fibrous materials flame resistant to molten materials by application thereto of a flame resistant composition, and related articles and compositions. 4,446,202, Cl. 428-254.000.

Misra, Surya K.; and Openchowski, Richard A., to National Can Corporation. Method of forming seamless container. 4,445,813, Cl. 413-1.000.

Misuitoatsu Chemicals, Inc.: *See*—
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,446,133, Cl. 424-250.000.

Misumi, Akira: *See*—
Kumada, Masaharu; and Misumi, Akira, 4,446,404, Cl. 313-346.00R.

Mitchell, John D., to Garrett Corporation, The. Pressure regulator system. 4,445,532, Cl. 137-495.000.

Mitchell, Paul M. Lightweight, portable hunter's tree stand. 4,445,591, Cl. 182-222.000.

Mitsch, Ronald A., to United States of America, Navy. N-Substituted fluoroaziridines and process for making. 4,446,068, Cl. 260-239.00E.

Mitsev, Sergei G.: *See*—
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyahev, Ivan S.; Laksov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, 4,446,347, Cl. 200-144.00R.
Hirao, Tadashi, 4,445,268, Cl. 29-571.000.
Inoue, Takeo; and Shirazawa, Takashi, 4,445,715, Cl. 285-54.000.
Kawaguchi, Kenji; Hamada, Osamu; Hiramoto, Seigo; Kato, Yukio; and Yamada, Kozo, 4,446,351, Cl. 219-69.00W.
Mitsumori, Mitsugi; Hosaka, Hiroaki; Sato, Hiroshi; and Kondou, Kouichi, 4,445,614, Cl. 206-599.000.
Momoyama, Tsutomu, 4,445,478, Cl. 123-418.000.
Sekine, Yasuhiro; Kuwayama, Masayuki; and Harada, Hiroshi, 4,446,391, Cl. 310-62.000.
Shigeta, Katsunori; Nakamura, Takashi; Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,446,520, Cl. 364-400.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Sakaguchi, Katsuyoshi; and Hasegawa, Akira, 4,445,834, Cl. 425-36.000.

Mitsubishi Light Metal Industries Limited: *See*—
Kawamata, Yutaka; and Katsuki, Shunkichi, 4,445,996, Cl. 204-294.000.

Mitsubishi Petrochemical Company Limited: *See*—
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, 4,446,283, Cl. 525-344.000.

Mitsui, Ryoichi: *See*—
Aoshima, Atsushi; and Mitsui, Ryoichi, 4,446,328, Cl. 568-479.000.

Mitsumori, Mitsugi; Hosaka, Hiroaki; Sato, Hiroshi; and Kondou, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Packaging box with pallet. 4,445,614, Cl. 206-599.000.

Mitten, Robert T.: *See*—
Knight, Raymond J.; Mitten, Robert T.; and Ripley, Robert L., 4,445,520, Cl. 131-282.000.

Miyadera, Yasuo; Fujioka, Atsushi; Kumazawa, Tetsuo; and Doi Hiroaki, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Laminates comprising prepregs metal clad. 4,446,191, Cl. 428-245.000.

Miyahara, Shiyoichiro: *See*—
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,446,133, Cl. 424-250.000.

Mizukami, Etsuo: *See*—
Endo, Yoshihiro; Kawaguchi, Masashi; Mizukami, Etsuo; and Kishishita, Hiroshi, 4,446,399, Cl. 313-505.000.

Mizukawa, Takumi; Amagami, Keizo; and Ogino, Yoshio, to Matsushita Electric Industrial Co., Ltd. Induction heating cooking apparatus. 4,446,350, Cl. 219-10.770.

Mizukoshi, Kiyoshi: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Ichihara, Kenzi; and Morishima, Takashi, 4,446,325, Cl. 546-283.000.

Mizumoto, Kastuji; and Yaguchi, Katsuhiko, to Pioneer Electronic Corporation. Frequency/voltage conversion circuit. 4,446,439, Cl. 328-140.000.

Mizuno, Chiaki; Tamai, Yasuo; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Magnetic recording tape having a leader tape. 4,446,205, Cl. 428-327.000.

Mizusaki, Takashi; Matsuo, Tadayuki; Esashi, Masayoshi; and Abe, Hiroshi, to Olympus Optical Co. Ltd. Ion sensor FET with surface treated metal gate. 4,446,474, Cl. 357-25.000.

Mo och Domsjo Aktieboiag: *See*—
Samuelson, Hans O., 4,445,969, Cl. 162-40.000.

Mobay Chemical Corporation: *See*—
Krishnan, Sivaram; and Baron, Arthur L., 4,446,297, Cl. 528-204.000.

Mobil Oil Corporation: *See*—
Arbit, Harold A., 4,445,991, Cl. 204-168.000.
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,446,537, Cl. 367-15.000.
Buyan, Frank M.; and Haddad, James H., 4,446,107, Cl. 422-107.000.
Chen, Nai Y.; Rankel, Lillian A.; and Rudnick, Leslie R., 4,446,004, Cl. 208-57.000.
Chester, Arthur W.; and Murray, James G., 4,446,243, Cl. 502-62.000.
Chu, Shaw C.; and Spencer, Arthur T., 4,446,258, Cl. 523-406.000.
Daines, John, 4,446,088, Cl. 264-155.000.
Givens, Wyatt W.; and Allen, Linus S., 4,446,369, Cl. 250-270.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,446,037, Cl. 252-47.500.
Hoskin, Dennis H., 4,446,079, Cl. 260-513.00R.
Schwab, Frederick C., 4,446,180, Cl. 428-35.000.
Smith, Fritz A., 4,446,007, Cl. 208-111.000.
Zachariadis, Robert G., 4,446,538, Cl. 367-19.000.

Mocas, Verlin A., to Richardson Company, The. Method for forming a metal casting extending through a preformed structure and articles produced thereby. 4,446,214, Cl. 429-179.000.

Mochida, Haruo: *See*—
Moriya, Makoto; and Mochida, Haruo, 4,446,380, Cl. 307-10.0AT.

Mochizuki, Keizo: *See*—
Hachiya, Iwao; Mochizuki, Keizo; and Kuwada, Yukio, 4,446,130, Cl. 424-195.000.

Modak, Shanta M.: *See*—
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, 4,446,124, Cl. 424-27.000.

Modone, Eros; and Roba, Giacomo, to Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A. Process and apparatus for on-line dehydrogenation of fiber-drawing preforms. 4,445,918, Cl. 65-3.120.

Moeremans, Marc K. J. J.: *See*—
De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,446,238, Cl. 436-527.000.

Moffett, Mark B.; and Konrad, William L., to United States of America, Navy. System for detection of transducer defects. 4,445,361, Cl. 73-1.0DV.

Mohnach, Michael G.: *See*—
Harbison, William H.; and Mohnach, Michael G., 4,445,249, Cl. 15-250.320.

Mohr, Karl; and Mohr, Wolfgang. Device for cutting paper, cardboard, and similar materials. 4,445,409, Cl. 83-157.000.

Mohr, Wolfgang: *See*—
Mohr, Karl; and Mohr, Wolfgang, 4,445,409, Cl. 83-157.000.

Moiseev, Valentin P.: *See*—
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Molaire, Michel F.: *See*—
Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., 4,446,302, Cl. 528-302.000.

Molenaar, Maarten; and Schreuder, Hermann A., to EnviroStrand, Inc. Process and apparatus for extruding stabilizers. 4,446,086, Cl. 264-118.000.

Momoyama, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control system for internal combustion engine. 4,445,478, Cl. 123-418.000.

Monarch Marking Systems, Inc.: *See*—
Cavender, Donald E., 4,446,182, Cl. 428-40.000.

Monsanto Company: *See*—
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlind, William, 4,446,061, Cl. 252-602.000.
McKay, Robert A., 4,446,431, Cl. 324-318.000.
Sikorski, James A.; and Hoobler, Mary A., 4,445,928, Cl. 71-87.000.
Sikorski, James A.; and Hoobler, Mary A., 4,445,929, Cl. 71-087.000.
Stejskal, Edward O., 4,446,430, Cl. 324-321.000.

Mont-Cler Appliances Inc.: *See*—
Chiaramonte, Vincent; and Barkow, Alice, 4,445,862, Cl. 433-191.000.

Montres Dodane-Precia-Gete: *See*—
Dodane, Raymond, 4,445,783, Cl. 368-105.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., to International Flavors & Fragrances Inc. Use of isomeric farnesene product-by-process for augmenting or enhancing the aroma or taste of foodstuffs, chewing gums, medicinal products and toothpastes. 4,446,125, Cl. 424-49.000.

Moore, Louis D.; Rule, Mark; and Wicker, Thomas H., to Eastman Kodak Company. Process for preparing high molecular weight polyesters. 4,446,303, Cl. 528-308.200.

Moore, Robert R.: *See*—
Slover, Pearl; and Moore, Robert R., 4,445,235, Cl. 4-144.200.

Moore, Russell L.; and Schanin, David J. Arrangement to time separate bidirectional current flow. 4,446,382, Cl. 307-241.000.

Morgan, Albert E., Jr., to Fong, Hiram L., Jr., a part interest. High speed displacement type hull. 4,445,453, Cl. 114-290.000.

Morgan, Albert W.: *See*—
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlind, William, 4,446,061, Cl. 252-602.000.

Morgan Construction Company: *See*—
Thompson, Gary J.; and Carey, C. H., 4,445,351, Cl. 72-43.000.

Mori, Hiroshi: *See*—
Saito, Tetsuya; and Mori, Hiroshi, 4,445,933, Cl. 75-59.000.

Mori, Kei. Support arm for a sunlight concentrating and collecting apparatus. 4,445,498, Cl. 126-424.000.

Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, to Murata Kikai Kabushiki Kaisha. Drafting apparatus in spinning machine. 4,445,252, Cl. 19-244.000.

Moriki, Yoshikazu; and Ogasawara, Masafumi, to Toray Industries, Inc. Spinneret for production of composite filaments. 4,445,833, Cl. 425-131.500.

Morisada, Kazutoshi: *See*—
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, 4,446,410, Cl. 318-687.000.

Morishima, Takashi: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Ichihara, Kenzi; and Morishima, Takashi, 4,446,325, Cl. 546-283.000.

Moriwaki, Yoshio: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; and Yamashita, Toshio, 4,446,121, Cl. 423-644.000.

Moriya, Makoto; and Mochida, Haruo, to Nissan Motor Company, Limited. Keyless device actuating system for an automotive vehicle. 4,446,380, Cl. 307-10.0AT.

Morozov, Jury E.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Morse, John B., to Polaroid Corporation. Film processor. 4,445,770, Cl. 354-303.000.

Moskowitz, Ronald: *See*—
Raj, Kuldip; Moskowitz, Ronald; and Rodier, Raymond, 4,445,696, Cl. 277-80.000.

Moskvichev, Boris V.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., 4,446,316, Cl. 536-112.000.

Mostek Corporation: *See*—
Ireland, Jeffrey R., 4,446,436, Cl. 328-14.000.
Mai, Chao C.; Whitney, William M.; Gosney, William M.; and Gulyas, Donald J., 4,445,266, Cl. 29-571.000.

Motoe, Akihiro: *See*—
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, 4,445,934, Cl. 75-68.00A.

Motorola, Inc.: *See*—
Alaspa, Allan A., 4,446,390, Cl. 307-579.000.
Backof, Charles A., Jr., 4,446,565, Cl. 375-32.000.
Candelaria, Jon; and Heidinger, Kurt S., 4,446,194, Cl. 428-428.000.
Dworsky, Lawrence N.; and Kennedy, Garth R., 4,446,432, Cl. 324-71.500.
Gercekci, Anil; and Maeder, Heinz B., 4,446,475, Cl. 357-40.000.
Pierce, William D., 4,446,564, Cl. 375-8.000.

Mourou, Gerard: *See*—
Valdmanis, Janis A.; and Mourou, Gerard, 4,446,425, Cl. 324-77.00K.

Mrochek, John E.: *See*—
Dinsmore, Stanley R.; and Mrochek, John E., 4,446,105, Cl. 422-70.000.

Mueller, Richard, to American Hofmann Corporation. Balancing machine and support structures usable therewith for measuring unbalance in a rotor. 4,445,373, Cl. 73-473.000.

Mukai, Tadashi: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.

Muller, Edzard: *See*—
Eenboom, Algund; and Muller, Edzard, 4,446,453, Cl. 340-286.00M.

Muller, Ingo: *See*—
Hammerling, Guster; Muller, Ingo; and Menger, Erich, 4,446,104, Cl. 422-63.000.

Munehiro, Hidehiko, to Nippon Electric Co., Ltd. Serial printer with a linear motor printer carriage. 4,445,798, Cl. 400-320.000.

Munoz, George L.; and Munoz, William J. Reinforced plastic product. 4,446,177, Cl. 428-15.000.

Munoz, William J.: *See*—
Munoz, George L.; and Munoz, William J., 4,446,177, Cl. 428-15.000.

Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., to International Flavors & Fragrances Inc. Liquid or solid fabric softener composition comprising microencapsulated fragrance suspension and process for preparing same. 4,446,032, Cl. 252-8.600.

Munter, Ernst A., to Northern Telecom Limited. Magnitude comparator circuit and method. 4,446,452, Cl. 340-146.200.

Murata Kikai Kabushiki Kaisha: *See*—
Mima, Hiroshi, 4,445,317, Cl. 57-22.000.
Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, 4,445,252, Cl. 19-244.000.

Murdock, David L.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,445,926, Cl. 71-34.000.

Murray, James G.: *See*—
Chester, Arthur W.; and Murray, James G., 4,446,243, Cl. 502-62.000.

Murthy, Andiappan K. S.; Patel, Kundanbhai M.; and Bekker, Alex Y., to Allied Corporation. Process for production of light hydrocarbons by treatment of heavy hydrocarbons with water. 4,446,012, Cl. 208-130.000.

Musselman, Elvin M., to RCA Corporation. Vibration inhibiting mesh assembly for a pick-up tube. 4,446,398, Cl. 313-390.000.

Mussinan, Cynthia J.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.

Mustico, Carmen J., Jr.: *See*—
Waters, Paul E.; Vaughan, David S.; and Mustico, Carmen J., Jr., 4,445,596, Cl. 188-171.000.

Musy, Jacques, to Compagnie Generale des Etablissements Michelin. Tire, particularly for aiplanes, with crown reinforcement of textile cables and process for the manufacture thereof. 4,445,560, Cl. 152-200.000.

Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cephalosporin derivative and pharmaceutical composition containing the derivative. 4,446,137, Cl. 424-246.000.

Naarmann, Herbert: *See*—
Brandstetter, Franz; Echte, Adolf; Haaf, Franz; Hambrecht, Juergen; and Naarmann, Herbert, 4,446,277, Cl. 525-68.000.

Nabisco Brands, Inc.: *See*—
Wasserbach, Max L., 4,445,835, Cl. 425-131.100.

Nadolna, Henryka A.: *See*—
Nadolny, Henry; and Nadolna, Henryka A., 4,445,236, Cl. 4-255.000.

Nadolny, Henry; and Nadolna, Henryka A. Push-through pump. 4,445,236, Cl. 4-255.000.

Nagai, Kineshiro. Medicine for treatment of cervical erosion. 4,446,149, Cl. 424-273.00R.

Nagashima, Masayoshi: *See*—
Takiguchi, Ryohei; and Nagashima, Masayoshi, 4,446,467, Cl. 346-76.0PH.

Nager, Urs F., Jr., to Bernd y Corporation. Electrical service module with strain relief member. 4,446,330, Cl. 174-51.000.

Naito, Kenzo; Shinbo, Haruo; and Tsukamura, Kazuo, to Takeda Chemical Industries, Ltd. Method for producing 7-aminocephem compounds. 4,446,318, Cl. 544-26.000.

Naito, Ryoichi; Suyama, Tadakazu; and Iga, Yoshiro, to Green Cross Corporation, The. Process for heat treatment of aqueous solution containing human blood coagulation factor VIII. 4,446,134, Cl. 424-101.000.

Naka, Toshiaki: *See*—
Sato, Kiyoshi; Terashima, Minoru; Sorimachi, Haruo; Naka, Toshiaki; Kanno, Takeo; and Yamada, Fumiaki, 4,446,355, Cl. 219-216.000.

Nakae, Hiroyuki; Noguchi, Isamu; and Kondo, Masayuki, to Furukawa Electric Co., Ltd., The. Crosslinked polyolefin foam containing a high concentration of an inorganic material and process for producing the same. 4,446,254, Cl. 521-92.000.

Nakagawa, Sumio: *See*—
Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, 4,445,841, Cl. 431-27.000.

Nakai, Satoshi: *See*—
Shimakawa, Hajime; and Nakai, Satoshi, 4,446,008, Cl. 208-111.000.

Nakamizo, Nobuhiro; Obase, Hiroyuki; Kubo, Kazuhiro; and Kasuya, Yutaka. Hypotensive piperidine derivatives. 4,446,141, Cl. 424-267.000.

Nakamura, Ken: *See*—
Inoue, Mitsumasa; Nakamura, Ken; Yokoyama, Junichi; and Yonezawa, Atsushi, 4,445,480, Cl. 123-432.000.

Nakamura, Masaaki; and Ueba, Hisaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Kureha Gosen Kabushiki Kaisha. Apparatus for manufacturing a string construction. 4,445,964, Cl. 156-500.000.

Nakamura, Sukenori: *See*—
Maekawa, Masakazu; Nakamura, Sukenori; Sugiyama, Masatoshi; and Odawara, Hideo, 4,446,174, Cl. 427-261.000.

Nakamura, Takashi: *See*—
Shigeta, Katsunori; Nakamura, Takashi; Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,446,520, Cl. 364-400.000.

Nakamura, Toshiaki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.

Nakano, Kazumi: *See*—
Takakuwa, Eiji; Nakano, Kazumi; and Kizitani, Izumi, 4,445,479, Cl. 123-425.000.

Nakao, Masami; Okimoto, Haruo; Yada, Yoshikuni; and Takeshita, Junki, to Toyo Kogyo Co., Ltd. Air intake system for supercharged automobile engine. 4,445,474, Cl. 123-336.000.

Nakauchi, Kenji, to Fuji Photo Film Co., Ltd. Method of and apparatus for measuring scene brightness. 4,445,778, Cl. 356-222.000.

Nakayama, Teruo: *See*—
Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, 4,445,252, Cl. 19-244.000.

Nashawaty, Ralph G. Stove alarm system. 4,446,455, Cl. 340-568.000.

Nassau Recycle Corporation: *See*—
Budzich, Mieczyslaw; and Fitz, Forest G., Jr., 4,445,355, Cl. 72-250.000.

National Can Corporation: *See*—
Misra, Surya K.; and Openchowski, Richard A., 4,445,813, Cl. 413-1.000.

National Distillers and Chemical Corporation: *See*—
Fayter, Richard G., Jr.; and Hall, Allen L., 4,446,077, Cl. 260-465.00K.

National Research Development Corporation: *See*—
Backhouse, Richard J., 4,446,533, Cl. 364-900.000.

National Semiconductor Corporation: *See*—
Smith, Frederick J., 4,446,534, Cl. 365-96.000.

Navi, Menashe. Method and apparatus for variable density inking. 4,445,433, Cl. 101-350.000.

Neary, Michael P. Solar energy system. 4,446,041, Cl. 252-70.000.

Neidich, Douglas A., to Du Pont de Nemours, E. I., and Company. Rib cage terminal. 4,445,747, Cl. 339-256.00R.

Nelson, Eric L., to Nelson Research & Development Company. Method and composition for treating mouth pain. 4,446,140, Cl. 424-260.000.

Nelson, Joseph N., to Engineered Products Company. Air filter restriction indicating device. 4,445,456, Cl. 116-268.000.

Nelson, Larry A.; and Schmidt, Leon W., to Instrumentation Laboratory Inc. Analysis system. 4,446,106, Cl. 422-72.000.

Nelson, Larry D. Welders glove. 4,445,232, Cl. 2-161.00R.

Nelson, Lorne W., to Honeywell Inc. Thermostat for control of an add-on heat pump system. 4,445,567, Cl. 165-29.000.

Nelson Research & Development Company: *See*—
Nelson, Eric L., 4,446,140, Cl. 424-260.000.

Nentwig, Jurgen, to Asto Import- und Exportgesellschaft M.B.H. & Co. Kg. Portioning and packing machine. 4,445,311, Cl. 53-575.000.

Nerenberg, Samuel T. Pancreas specific protein systems. 4,446,240, Cl. 436-542.000.

Neumann, Franz. Food portioning machine. 4,445,548, Cl. 141-1.000.

Nevalainen, Kyosti: *See*—
Lehikoinen, Keijo; and Nevalainen, Kyosti, 4,445,299, Cl. 49-167.000.

New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J., 4,445,286, Cl. 36-32.00R.

New, Nigel H.; and O'Rourke, John B., to Glacier Metal Company, Limited, The. Lubrication system. 4,445,592, Cl. 184-6.130.

Newman, Raymond C.: *See*—
Leitch, James K.; Newman, Raymond C.; and Gray, Cameron B., 4,445,656, Cl. 248-49.000.

Newton, Charles L. Process for liquefying methane. 4,445,916, Cl. 62-17.000.

Ng, Ping F.: *See*—
D'Andrade, Bruce M.; Ng, Ping F.; and Ma, Tak M., 4,445,297, Cl. 46-230.000.

NGK Insulators, Ltd.: *See*—
Suzuki, Go; and Michishita, Kazuo, 4,445,274, Cl. 29-832.000.

NGK Spark Plug Co., Ltd.: *See*—
Sakai, Masao; Hashizume, Miyakazu; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,446,058, Cl. 252-507.000.

Nguyen-Thanh, Thong, to Commissariat a l'Energie Atomique. Superheated steam generator. 4,445,568, Cl. 165-81.000.

Nibert, Roger K.: *See*—
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,446,203, Cl. 428-283.000.

Nicholls, Robert L. Air-inflated fabric-reinforced concrete shells. 4,446,083, Cl. 264-32.000.

Nicksic, Stephen W., to Chevron Research Company. Scrubbing hydrogen sulfide from a fuel gas. 4,446,118, Cl. 423-226.000.

Niedermeier, Johann: *See*—
Schiele, Bernd; and Niedermeier, Johann, 4,445,494, Cl. 125-35.000.

Nielsen, Arne, to Sig Societe Industrielle Suisse. Railway track tamping machine. 4,445,437, Cl. 104-12.000.

Nielsen, John M., to Babcock & Wilcox Company, The. Hermetically sealed high temperature strain gage. 4,445,386, Cl. 73-780.000.

Nihon Koki Kabushiki Kaisha: *See*—
Ishii, Tetsuro; Oyama, Tadanori; Yamashita, Masashi; Kzome, Kazuyuki; Ikeda, Tsutomu; and Fujioka, Satoru, 4,445,981, Cl. 204-18.100.

Niimura, Kouichi: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.

Nikishkin, Vladimir I.: *See*—
Ivanov, Andrei S.; Komorin, Leonid V.; Nikishkin, Vladimir I.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,446,374, Cl. 250-492.300.

Niklasson, Tage, to FIAB System AB. Method and apparatus for manufacturing of articles from one or several film webs welded to and stripped from a conveyor belt. 4,445,960, Cl. 156-344.000.

Nilsson, Jan: *See*—
Adlerborn, Jan; Larker, Hans; Mattsson, Bertil; and Nilsson, Jan, 4,446,100, Cl. 419-48.000.

Nimberger, Spencer M.: *See*—
Sullivan, William C.; and Nimberger, Spencer M., 4,445,400, Cl. 74-711.000.

Ning, Tak H.: *See*—
Isaac, Randall D.; Ning, Tak H.; and Tang, Denny D., 4,446,476, Cl. 357-67.000.

Ninomiya, Yasuo: *See*—
Baker, Richard W.; and Ninomiya, Yasuo, 4,445,641, Cl. 239-6.000.

Nippon Clean Engine Research Institute Co., Ltd.: *See*—
Onishi, Sigeru; and Jo, Souk H., 4,445,468, Cl. 123-73.00C.

Nippon Electric Co., Ltd.: *See*—
Misaizu, Tetsuo, 4,446,387, Cl. 307-450.000.
Munehiro, Hidehiko, 4,445,798, Cl. 400-320.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,446,442, Cl. 330-149.000.
Nippon Kogaku K.K.: *See*—
Ishikawa, Yuzuru; and Tanaka, Masashi, 4,445,777, Cl. 356-139.000.
Nippon Soken, Inc.: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.
Nippon Steel Corporation: *See*—
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, 4,445,946, Cl. 148-36.000.
Nippondenso Co., Ltd.: *See*—
Takakuwa, Eiji; Nakano, Kazumi; and Kizitani, Izumi, 4,445,479, Cl. 123-425.000.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, 4,446,410, Cl. 318-687.000.
Nishi, Katsuhide: *See*—
Maeda, Hiroshi; and Nishi, Katsuhide, 4,446,136, Cl. 424-177.000.
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, to Kabushiki Kaisha Kobe Seiko Sho. Extrusion method using hot lubricant. 4,445,350, Cl. 72-38.000.
Nishikage, Tadao: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,446,273, Cl. 524-556.000.
Nishimura, Shinichi: *See*—
Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, 4,445,252, Cl. 19-244.000.
Nishimura, Toshifumi, to Hitachi, Ltd. Data compaction system with contiguous storage of non-redundant information and run length counts. 4,446,516, Cl. 364-200.000.
Nishiyama, Shinroku. Powdery dust separating apparatus in dust collector. 4,445,913, Cl. 55-302.000.
Nissan Motor Company, Limited: *See*—
Fukushima, Masao; and Yazaki, Komei, 4,445,662, Cl. 248-559.000.
Hayashi, Yoshimasa, 4,445,471, Cl. 123-198.00E.
Higashi, Katunori, 4,445,487, Cl. 123-568.000.
Ikeura, Kenji, 4,445,477, Cl. 123-416.000.
Inoue, Mitsumasa; Nakamura, Ken; Yokoyama, Junichi; and Yonezawa, Atsushi, 4,445,480, Cl. 123-432.000.
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,445,491, Cl. 123-605.000.
Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, 4,445,584, Cl. 180-69.220.
Moriya, Makoto; and Mochida, Haruo, 4,446,380, Cl. 307-10.0AT.
Ogawa, Naoki; and Abe, Toshiro, 4,445,472, Cl. 123-198.00E.
Yaotani, Kouichi; and Ogawa, Yasuyuki, 4,445,721, Cl. 296-154.000.
Nitrokemia Ipartelepek: *See*—
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.
Niwa, Senji; Sasaki, Takuji; Shinto, Masaaki; and Imamura, Noriaki, to Kawasaki Jukogyo Kabushiki Kaisha. Plate catalyst body for denitration. 4,446,250, Cl. 502-309.000.
Noda, Koshi: *See*—
Morihashi, Toshifumi; Noda, Koshi; Nakayama, Teruo; Nishimura, Shinichi; and Fujiwara, Michiaki, 4,445,252, Cl. 19-244.000.
Noe, James C.: *See*—
Kinsell, Robert C.; and Noe, James C., 4,445,639, Cl. 237-81.000.
Noel, John R., to Procter & Gamble Company, The. Bib having gravitationally openable pocket. 4,445,231, Cl. 2-49.00R.
Noguchi, Isamu: *See*—
Nakae, Hiroyuki; Noguchi, Isamu; and Kondo, Masayuki, 4,446,254, Cl. 521-92.000.
Noguchi, Masataka: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.
Noirot-MT: *See*—
Arribas, Cecilio; and Blassiau, Rene E., 4,446,359, Cl. 219-485.000.
Nolte, Wilfried: *See*—
Hombach, Rudolf; Nolte, Wilfried; Russell, Peter J.; and Wall, Nigel G., 4,445,959, Cl. 156-332.000.
Nordiskafilt AB: *See*—
Eklund, Nils O., 4,446,187, Cl. 428-136.000.
Norris, Robert D.: *See*—
Betermier, Benedicte; Alvarez, Manuel; and Norris, Robert D., 4,446,029, Cl. 210-748.000.
Northern Telecom Limited: *See*—
Munter, Ernst A., 4,446,452, Cl. 340-146.200.
Rosch, Reinhard W., 4,446,338, Cl. 179-18.0FA.
Yataki, Masamichi; Dack, Glen W. D.; and Ertl, Paul S., 4,445,649, Cl. 242-118.200.
Norton, Edward J., to New Balance Athletic Shoe, Inc. Footwear, such as athletic shoe. 4,445,286, Cl. 36-32.00R.
Novation, Inc.: *See*—
Kessler, Bayard F., 4,446,333, Cl. 179-2.00C.
Novenyvedelmi Kutato Intezet: *See*—
Gimesi, Antal; Baracskai, Jozsef; Fodor, Ferenc; Gaal, Antal; Horvath, Andras; and Kolonics, Zoltan, 4,445,927, Cl. 71-86.000.
Noyori, Ryoji; Suzuki, Sakaru; and Okayama, Minoru, to Seikagaku Kogyo Co., Ltd. C-β-D-Xylopyranoside aeries compounds. 4,446,312, Cl. 536-1.100.
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., to Research Foundation of State University of New York. Method of disinfecting water with insoluble disinfectant compositions. 4,446,103, Cl. 422-37.000.
Nutcher, Peter B., to Process Combustion Corporation. Low NO_x burners. 4,445,843, Cl. 431-115.000.
Nuttal, Michael; and Yamamoto, Shoji, to Tomy Corporation. Apparatus for producing rubbings. 4,445,868, Cl. 434-88.000.
Nuttall, Brian; and Laxson, Charles F., to Chubb & Son's Lock and Safe Company. Security doors. 4,445,718, Cl. 292-341.170.
Nutter, John F.: *See*—
LaDelfa, Christopher; and Nutter, John F., 4,445,976, Cl. 201-41.000.
Oakes, Billy D.: *See*—
DuPart, Michael S.; Oakes, Billy D.; and Cringle, David C., 4,446,119, Cl. 423-228.000.
Oakes, Edmond G.; Arndt, Frederick P.; and Grandel, Leonard F., to General Motors Corporation. Energy absorbing steering column for vehicles. 4,445,708, Cl. 280-777.000.
Obase, Hiroyuki: *See*—
Nakamizo, Nobuhiro; Obase, Hiroyuki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,446,141, Cl. 424-267.000.
Oberg, Gordon D. Oil filter assembly having a removable filter member. 4,446,017, Cl. 210-90.000.
O'Brien, William G., to Du Pont de Nemours, E. I., and Company. Beveled edge metered bead extrusion coating apparatus. 4,445,458, Cl. 118-401.000.
Obst, Donald L.: *See*—
Coleman, John D.; Obst, Donald L.; and Kraft, Heinrich A., 4,445,593, Cl. 187-1.00R.
Occidental Chemical Co.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,445,926, Cl. 71-34.000.
O'Cheskey, Theodore H.; and Edwards, Hugh T., Jr., to United States Filter Fluid Systems Corp. Filter leaf. 4,446,352, Cl. 219-121.0LC.
Ochiai, Chiaki: *See*—
Ohmi, Atsushi; and Ochiai, Chiaki, 4,445,425, Cl. 92-98.00D.
O'Connell, Drew P.: *See*—
Cole, William E.; O'Connell, Drew P.; and Griffith, James L., 4,445,919, Cl. 65-27.000.
Odawara, Hideo: *See*—
Maekawa, Masakazu; Nakamura, Sukenori; Sugiyama, Masatoshi; and Odawara, Hideo, 4,446,174, Cl. 427-261.000.
Oehler, John H. Rechargeable fluid driven dental tool. 4,445,860, Cl. 433-132.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., 4,446,424, Cl. 324-62.000.
Ribaud, Yves J.; and Kergreis, Gilbert F., 4,445,816, Cl. 415-181.000.
Ogasawara, Masafumi: *See*—
Moriki, Yoshikazu; and Ogasawara, Masafumi, 4,445,833, Cl. 425-131.500.
Ogata, Masayuki: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.
Ogawa, Akira: *See*—
Sugiyama, Masatoshi; Yoshida, Kazutaka; and Ogawa, Akira, 4,446,470, Cl. 346-140.00R.
Ogawa, Naoki; and Abe, Toshiro, to Nissan Motor Co., Ltd. Internal combustion engine with bearing beam structure. 4,445,472, Cl. 123-198.00E.
Ogawa, Yasuyuki: *See*—
Yaotani, Kouichi; and Ogawa, Yasuyuki, 4,445,721, Cl. 296-154.000.
Ogden, Ralph. Exercise treadmill with rockable feet. 4,445,683, Cl. 272-69.000.
Ogino, Yoshio: *See*—
Mizukawa, Takumi; Amagami, Keizo; and Ogino, Yoshio, 4,446,350, Cl. 219-10.770.
Ogunro, E. Olayinka. Prosthetic nail for surgical attachment to a finger or toe. 4,445,234, Cl. 3-1.000.
O'Gwynn, David C.: *See*—
Williams, Marshall; and O'Gwynn, David C., 4,446,389, Cl. 307-515.000.
O'Hara, Francis J., to Raytheon Company. Microwave phase discriminator. 4,446,388, Cl. 307-511.000.
Oharek, Frank J.: *See*—
Breglia, Denis R.; and Oharek, Frank J., 4,446,480, Cl. 358-104.000.
Ohe, Takeshi: *See*—
Ohsaki, Hiroshi; and Ohe, Takeshi, 4,445,818, Cl. 417-288.000.
Ohkubo, Takashi: *See*—
Okazaki, Haruo; and Ohkubo, Takashi, 4,446,274, Cl. 524-812.000.
Ohmi, Atsushi; and Ochiai, Chiaki, to Aisin Seiki Kabushiki Kaisha. Housing shells of fluid pressure motors. 4,445,425, Cl. 92-98.00D.
Ohmori, Taiji: *See*—
Sato, Makoto; Ohmori, Taiji; and Tsuchiya, Yoshikazu, 4,446,522, Cl. 364-426.000.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Folding guide assembly. 4,445,293, Cl. 43-24.000.

Ohnishi, Shunsaku: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.

Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Ichihara, Kenzi; and Morishima, Takashi, to Maruko Seiyaku Co., Ltd. 1,4-Dihydropyridine compounds. 4,446,325, Cl. 546-283.000.

Ohsaki, Hiroshi; and Ohe, Takeshi, to Jidosha Kiki Co., Ltd. Apparatus for supplying hydraulic fluid. 4,445,818, Cl. 417-288.000.

Ohsawa, Kazuya; Shibata, Toshiaki; and Takahashi, Kenichi, to Director-General of Agency of Industrial Science and Technology. Infrared transmitting optical wave guide. 4,445,755, Cl. 350-96.340.

Ohte, Akira: *See*—
Nishihara, Masao; Matsushita, Tomiharu; Noguchi, Masataka; Arimura, Kazuo; Ohte, Akira; Kimura, Tetsuo; Iwai, Akira; and Hayashida, Nobuo, 4,445,350, Cl. 72-38.000.

Ohwada, Kunio, to Kabushiki Kaisha Fujikoshi t/a Nachi-Rujikoshi Corp. Slicing cutter blade. 4,445,413, Cl. 83-676.000.

Okabe, Sigeru: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.

Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, to Hitachi, Ltd. Fuel cell electrode. 4,446,210, Cl. 429-42.000.

Okamoto, Koji: *See*—
Hobo, Sumiya; and Okamoto, Koji, 4,445,855, Cl. 433-59.000.

Okayama, Minoru: *See*—
Noyori, Ryoji; Suzuki, Sakaru; and Okayama, Minoru, 4,446,312, Cl. 536-1.100.

Okazaki, Haruo; and Ohkubo, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Vinyl acetate-ethylene copolymer emulsion and aqueous emulsion adhesive composition containing the emulsion. 4,446,274, Cl. 524-812.000.

Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, to Misuitoatsu Chemicals, Inc. 1-Phenyl-4-carbamoyl piperazine compounds, process for preparation thereof and utilizations thereof. 4,446,133, Cl. 424-250.000.

Okimoto, Haruo: *See*—
Nakao, Masami; Okimoto, Haruo; Yada, Yoshikuni; and Takeshita, Junki, 4,445,474, Cl. 123-336.000.

Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., to Borg-Warner Corporation. Asbestos-free friction materials. 4,446,203, Cl. 428-283.000.

Okumura, Nobuya; Ichihashi, Tetsuo; Matsumura, Shunichi; and Inata, Hiroo, to Teijin Limited. Protection from ultraviolet light by use of novel ultraviolet absorber. 4,446,262, Cl. 524-89.000.

Olejak, Ingo W. V., to Koomey, Inc. Hose clamp for supporting a vertically extending control line. 4,445,255, Cl. 24-284.000.

Olson, Wallace F.; and Rodgers, Ned, to Smith International, Inc. Shrink grip drill pipe fabrication method. 4,445,265, Cl. 29-447.000.

Oltarzewski, Edward S.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,446,032, Cl. 252-8.600.

Olympus Optical Co., Ltd.: *See*—
Fujibayashi, Kenji, 4,446,441, Cl. 330-149.000.
Kawazoe, Mitsuo, 4,445,767, Cl. 354-195.100.
Mizusaki, Takashi; Matsuo, Tadayuki; Esashi, Masayoshi; and Abe, Hiroshi, 4,446,474, Cl. 357-25.000.
Osanai, Akira, 4,446,496, Cl. 360-74.100.
Terui, Nobuo, 4,446,493, Cl. 360-65.000.
Watanabe, Seizou, 4,446,170, Cl. 427-130.000.

OMAC, Inc.: *See*—
Hueberger, Lawrence K., 4,445,655, Cl. 244-214.000.

Omaki, Takanobu: *See*—
Ishikawa, Norio; and Omaki, Takanobu, 4,445,761, Cl. 354-402.000.

Omikron Scientific Ltd.: *See*—
Krupka, Yaakov; Feldman, Salomon; and Yerushalmi, Shmuel, 4,445,512, Cl. 128-419.0PT.

Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., to University of Texas System. Electrostatic imaging method. 4,446,365, Cl. 250-213.00R.

Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., to Gosudarstvenny Proektny I Nauchno-Issledovatelsky Institut Gipronikel. Method of recovering ferronickel from oxidated nickel ores. 4,445,932, Cl. 75-11.000.

Onishi, Sigeru; and Jo, Souk H., to Nippon Clean Engine Research Institute Co., Ltd. 2-Stroke internal combustion engine and an ignition-combustion method of an internal combustion engine. 4,445,468, Cl. 123-73.00C.

Ono, Motoyuki: *See*—
Takaoka, Michio; Ono, Motoyuki; Kaji, Isao; and Yagi, Shigeki, 4,446,331, Cl. 174-73.00R.

Ono Pharmaceutical Co., Ltd.: *See*—
Tasouchi, Tadao; Shigeoka, Satoshi; Kawamura, Masanori; Hayashi, Masaki; Terashima, Hiroshi; and Hirata, Fumio, 4,446,143, Cl. 424-270.000.

Ono, Takatoshi: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,445,300, Cl. 51-283.00R.

Onofusa, Norio: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,446,273, Cl. 524-556.000.

Openchowski, Richard A.: *See*—
Misra, Surya K.; and Openchowski, Richard A., 4,445,813, Cl. 413-1.000.

Oppl, Gunter; and Schmitt, Gunther, to FAG Kugelfischer Georg Schafer & Co. Spindle brake. 4,445,320, Cl. 57-88.000.

Orengo, Gerard; and Verhaeghe, Michel, to International Business Machines Corporation. Voltage comparator with a wide common mode input voltage range. 4,446,385, Cl. 307-355.000.

Orie, Thomas A., Sr. Insulating secondary roof system. 4,445,305, Cl. 52-309.900.

Orimoto, Akira; and Kamei, Kazuo, to Pioneer Electronic Corporation. Tape player repeat reproduction with overlap. 4,446,495, Cl. 360-74.100.

Orinox Co., Ltd.: *See*—
Yamazaki, Shogo, 4,445,766, Cl. 354-79.000.

Orlando, Franklin P.: *See*—
Browning, James T.; and Orlando, Franklin P., 4,445,316, Cl. 56-330.000.

Oronzio de Nora S.A.: *See*—
Benedetto, Enrico, 4,445,987, Cl. 204-98.000.

O'Rourke, John B.: *See*—
New, Nigel H.; and O'Rourke, John B., 4,445,592, Cl. 184-6.130.

Osanai, Akira, to Olympus Optical Co., Ltd. Automatic reverse tape recorder. 4,446,496, Cl. 360-74.100.

Ostby, Donald H.: *See*—
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,445,912, Cl. 55-283.000.

Ostby, Robert R.: *See*—
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,445,912, Cl. 55-283.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,445,500, Cl. 128-1.00R.

Osterholm, Jewell L., to Thomas Jefferson University. Extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,445,514, Cl. 128-632.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,445,886, Cl. 604-28.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,445,887, Cl. 604-28.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,445,888, Cl. 604-28.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,446,154, Cl. 424-350.000.

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O'Sullivan Corporation: *See*—
Dawson, C. Bruce, 4,445,836, Cl. 425-135.000.

Oswald, Gerald L., to Atlas Powder Company. Electronic delay blasting circuit. 4,445,435, Cl. 102-215.000.

Otsuka Chemical Co., Ltd.: *See*—
Shibuta, Osamu; Suzue, Masayoshi; and Hasegawa, Tetuo, 4,446,295, Cl. 528-168.000.

Ott, Karl-Heinz: *See*—
Binsack, Rudolf; Lindner, Christian; Rempel, Dieter; and Ott, Karl-Heinz, 4,446,276, Cl. 525-64.000.

Ottos, James G., to RCA Corporation. Method of detecting the vaporization of getter material during manufacture of a CRT. 4,445,872, Cl. 445-3.000.

Ouellette, Maurice J.; and Hughes, William C., to General Electric Company. Method and apparatus for multiple frequency transmission of information in a digital communication system. 4,446,462, Cl. 340-825.070.

Oules, Jacques, to Hydroconsult, S.A. Appliance for dredging the bottom of a body of water. 4,445,290, Cl. 37-66.000.

Ouwerkerk, Anton V.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.

Ovren, Christer: *See*—
Brogardh, Torgny; Ovren, Christer; and Sander, Lars, 4,446,366, Cl. 250-227.000.

Owada, Shuji: *See*—
Shida, Masaharu; Ueda, Makoto; Torisawa, Akira; Owada, Shuji; and Mandai, Masaaki, 4,445,784, Cl. 368-157.000.

Owens-Illinois, Inc.: *See*—
Francel, Josef; Stewart, Daniel R.; and Horn, Uriah, 4,446,241, Cl. 501-14.000.
Shetterly, Donivan M., 4,445,923, Cl. 65-158.000.
Thomas, Ian M., 4,446,171, Cl. 427-160.000.

Owsley, Herbert B.: *See*—
Bunn, Stuart E.; and Owsley, Herbert B., 4,445,824, Cl. 417-440.000.
Oxenrider, Bryce C., to Allied Corporation. Oligomer-containing mixtures useful as fiber surface treating agents and processes for the production and use thereof. 4,446,306, Cl. 528-366.000.
Oy Helo Tehtaat: *See*—
Rimmi, Pentti I., 4,446,356, Cl. 219-272.000.
Oy Partek AB: *See*—
Louhio, Ilmari, 4,445,423, Cl. 91-492.000.
Oy Wartsila Ab: *See*—
Lehikoinen, Keijo; and Nevalainen, Kyosti, 4,445,299, Cl. 49-167.000.
Oyama, Tadanori: *See*—
Ishii, Tetsuro; Oyama, Tadanori; Yamashita, Masashi; Kzome, Kazuyuki; Ikeda, Tsutomu; and Fujioka, Satoru, 4,445,981, Cl. 204-18.100.
P. D. George Company, The: *See*—
Mabrey, David W.; Lange, Daniel J.; and Lee, Daniel J., 4,446,300, Cl. 528-288.000.
Pack, Howard M. Method and composition for reducing weight. 4,446,138, Cl. 424-248.570.
Pairaudeau, Reginald D.; and Turnbull, David, to Union Carbide Corporation. Carbon fiber-reinforced cement mould. 4,446,091, Cl. 264-225.000.
Palko, Aloysius A.: *See*—
Posey, Franz A.; and Palko, Aloysius A., 4,445,935, Cl. 75-118.00P.
Palowkar, David R.: *See*—
Ranby, Peter W.; and Palowkar, David R., 4,446,048, Cl. 252-301.405.
Palvadeau, Claude: *See*—
Beutier, Didier; Palvadeau, Claude; Pasquier, Gilles; and Dietrich, March, 4,446,026, Cl. 210-639.000.
Papeteries de Jean d'Heurs: *See*—
Bartelloni, Rene, 4,445,972, Cl. 162-164.100.
Pappalardo, Romano G.; and Peters, Thomas E., to GTE Laboratories Incorporated. Yellow-emitting halophosphate phosphor of improved brightness and method. 4,446,049, Cl. 252-301.60P.
Papsidero, Lawrence: *See*—
Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, 4,446,122, Cl. 424-1.100.
Parker, Dane K., to Goodyear Tire & Rubber Company, The. Method for preparing a polymer containing pendant unsaturation. 4,446,284, Cl. 525-383.000.
Parker, David L., to Barber, Bob, Jr., a part interest. Reversible ratchet wrench. 4,445,404, Cl. 81-62.000.
Parker-Hannifin Corporation: *See*—
Mayfield, William B., 4,445,535, Cl. 137-535.000.
Parker, John J.: *See*—
Fouss, James L.; and Parker, John J., 4,445,542, Cl. 138-94.000.
Parker, Robert. Surface temperature measuring device with reversible thermochromic film. 4,445,787, Cl. 374-141.000.
Partington, Sally: *See*—
Beales, Keith J.; Partington, Sally; and Dunn, Anthony G., 4,445,754, Cl. 350-96.340.
Partnership of Robert M. Paul: *See*—
Paul, Robert M., 4,445,237, Cl. 4-417.000.
Pasquier, Gilles: *See*—
Beutier, Didier; Palvadeau, Claude; Pasquier, Gilles; and Dietrich, March, 4,446,026, Cl. 210-639.000.
Patel, Bhupendra C., to Kendall Company, The. Catheter. 4,445,890, Cl. 604-103.000.
Patel, Bhupendra C., to Kendall Company, The. Catheter. 4,445,891, Cl. 604-103.000.
Patel, Harshad K.; and Illick, Andjelko, to Mica Corporation, The. Multi-layered circuit board. 4,446,188, Cl. 428-138.000.
Patel, Kundanbhai M.: *See*—
Murthy, Andiappan K. S.; Patel, Kundanbhai M.; and Bekker, Alex Y., 4,446,012, Cl. 208-130.000.
Patrick S.A.: *See*—
Beneteau, Charles, 4,445,289, Cl. 36-134.000.
Patris, Frank N.: *See*—
Friedmann, Paul G.; Patris, Frank N.; and Tomalesky, Allan W., 4,446,562, Cl. 373-149.000.
Patterson, Raymond B., III, to Harris Corporation. CMOS Amplifier. 4,446,444, Cl. 330-264.000.
Patterson, Richard A.: *See*—
Brochman, Wilfred R.; and Patterson, Richard A., 4,445,620, Cl. 220-271.000.
Pattison, William W., Jr.: *See*—
Byrd, Audis C.; Todd, Bradley L.; and Pattison, William W., Jr., 4,445,465, Cl. 122-392.000.
Paul, Robert M., to Partnership of Robert M. Paul. Close coupled water-closet combination and adapter. 4,445,237, Cl. 4-417.000.
Pauquette, James J.: *See*—
Stark, Martin H.; Pisani, George V.; and Pauquette, James J., 4,445,691, Cl. 273-155.000.
Pawlowski, Michael: *See*—
Arena, Alan J.; Pounder, Edwin; Pawlowski, Michael; and Totten, Adrian M., 4,445,781, Cl. 366-154.000.
Payer, Wolfgang: *See*—
Hobes, John; Payer, Wolfgang; and Deymann, Detlef, 4,446,311, Cl. 528-493.000.
Peabody Process Systems, Inc.: *See*—
Bakke, Even, 4,446,109, Cl. 422-168.000.
Peart, Edward L.; and Howard, Charlie J., to Sybron Corporation. Thermometer or other instrument assembly. 4,445,789, Cl. 374-198.000.
Pedain, Josef: *See*—
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Peerless Pressed Metal, Inc.: *See*—
Sparrow, Richard S., Jr., 4,445,782, Cl. 366-217.000.
Peffer, John R.: *See*—
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Post, Richard L.; and Fort, Robert G., 4,445,970, Cl. 162-135.000.
Perkins, Thomas K., to Atlantic Richfield Company. Borehole cementing over water. 4,445,575, Cl. 166-290.000.
Perna, Theodore P., to Xerox Corporation. Ink jet printer array. 4,446,469, Cl. 346-140.00R.
Pernici, Ermanno, to C.I.E.F. -Compagnia Immobiliare e Finanziaria S.p.A. Ceramic tile with its rear configured as uniformly distributed projections. 4,446,190, Cl. 428-156.000.
Perrin, Georges J.: *See*—
Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, 4,445,785, Cl. 368-187.000.
Peters, Donald, to American Stabilis, Inc. Temperature comparison apparatus and methods. 4,445,636, Cl. 236-20.00R.
Peters, Jerry M. Improved table saw arrangement. 4,445,412, Cl. 83-477.200.
Peters, Thomas, III, to Tree Farmers International, Inc. Colter tree cutting system. 4,445,557, Cl. 144-336.000.
Peters, Thomas E.: *See*—
Pappalardo, Romano G.; and Peters, Thomas E., 4,446,049, Cl. 252-301.60P.
Peterson, Robert W.; Grenier, Aime J.; and Hirsbrunner, Hans G., to Texas Instruments Incorporated. Circuit control system. 4,446,501, Cl. 361-114.000.
Petrolite Corporation: *See*—
Bessler, Donald U., 4,446,054, Cl. 252-344.000.
Thompson, Neil E. S., 4,446,056, Cl. 252-391.000.
Petty, Randall H.; and Bartley, Burton H., to Texaco Inc. Fluid catalytic cracking. 4,446,010, Cl. 208-120.000.
Pfeiffer, Gerd; Stinnertz, Horst; and Zeunert, Fritz. Procedure and equipment for the manufacture of pipes with external and internal diameters varying in stages. 4,445,354, Cl. 72-208.000.
Pfeiffer, Josef: *See*—
Kolbe, Joachim; Kortmann, Wilfried; and Pfeiffer, Josef, 4,446,034, Cl. 252-8.800.
Philip Morris Incorporated: *See*—
Knight, Raymond J.; Mitten, Robert T.; and Ripley, Robert L., 4,445,520, Cl. 131-282.000.
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Phillips Petroleum Company: *See*—
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Burns, Lyle D., 4,445,909, Cl. 44-72.000.
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Drake, Charles A,, 4,446,308, Cl. 528-481.000.
Mathis, Ronald D.; and Reed, Jerry O., 4,445,941, Cl. 134-3.000.
Romanek, Gerald A., 4,446,189, Cl. 428-152.000.
Phillips, Robert F.: *See*—
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Pierce, William D., to Motorola Inc. Phase locked loop frequency synthesizer circuit and method for intercomputer communication on a local network of broadband RF modems. 4,446,564, Cl. 375-8.000.
Pierson, Henri G. W. Vacuum belt filter. 4,446,023, Cl. 210-400.000.
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Galle, Edward L.; Hyldon, Roy G.; and Egar, William P., 4,446,163, Cl. 426-448.000.
Pindar, John F.; and Cohen, Jerome M., to Lubrizol Corporation, The. Organic compositions containing hydroxy-aromatic compounds useful as additives for fuels and lubricants. 4,446,039, Cl. 252-52.00R.
Pioneer Electronic Corporation: *See*—
Mizumoto, Kastuji; and Yaguchi, Katsuhiko, 4,446,439, Cl. 328-140.000.
Orimoto, Akira; and Kamei, Kazuo, 4,446,495, Cl. 360-74.100.
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Pisani, George V.: *See*—
Stark, Martin H.; Pisani, George V.; and Pauquette, James J., 4,445,691, Cl. 273-155.000.
Plast-Ad, Inc.: *See*—
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Dix, Peter; Pogany, George A.; and Sangha, Parminder, 4,446,313, Cl. 536-18.600.
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Benton, Stephen A., 4,445,749, Cl. 350-376.000.
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Morse, John B., 4,445,770, Cl. 354-303.000.

Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell; and Sahatjian, Ronald A., 4,446,305, Cl. 528-348.000.
Tarr, Fred P., 4,445,826, Cl. 417-476.000.
Whiteside, George D., 4,445,763, Cl. 354-417.000.

Pollard, John H., to United States of America, Army. Methods of making infrared photoconductors with passivation control. 4,445,269, Cl. 29-572.000.

Pollock, William H., to Combustion Engineering, Inc. Furnace construction having an ash pit with a radiation reflecting surface. 4,445,442, Cl. 110-171.000.

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Polychrome Corporation: *See*—
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Ponsford, Roger J.: *See*—
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Portat, Michel J.: *See*—
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., 4,446,424, Cl. 324-62.000.

Posey, Franz A.; and Palko, Aloysius A., to United States of America, Energy. Method for the recovery of silver from waste photographic fixer solutions. 4,445,935, Cl. 75-118.00P.

Post Office: *See*—
Beales, Keith J.; Partington, Sally; and Dunn, Anthony G., 4,445,754, Cl. 350-96.340.

Post, Richard L.; and Fort, Robert G., to Penntech Papers, Inc. High mineral composite fine paper. 4,445,970, Cl. 162-135.000.

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Potzick, James E.; and Robertson, Baldwin, to United States of America, Commerce. Long wavelength acoustic flowmeter. 4,445,389, Cl. 73-861.270.

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Arena, Alan J.; Pounder, Edwin; Pawlowski, Michael; and Totten, Adrian M., 4,445,781, Cl. 366-154.000.

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Power, Royal A.: *See*—
Engelke, Claude W.; Power, Royal A.; and Brees, Dale W., 4,445,652, Cl. 244-1.00R.

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Heller, Anton H., 4,445,848, Cl. 432-13.000.

Powers, Joseph E.; Grimoldi, Ranaldo H.; Williamson, Calvin C.; and Bottini, Alfred A., to Kaiser Steel Corporation. Pipe press. 4,445,357, Cl. 72-399.000.

Powers, Loren C., Jr., to International Paper Box Machine Co., The. Speed control for manufacturing process. 4,445,880, Cl. 493-28.000.

PPG Industries, Inc.: *See*—
Bennett, Terry A.; Eilenfeld, Herbert W.; and Lampman, Dewitt W., 4,445,921, Cl. 65-114.000.
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Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,446,292, Cl. 528-29.000.
Hawk, Thomas W., 4,445,953, Cl. 156-102.000.
Korach, Malcolm, 4,445,985, Cl. 204-72.000.
May, Earl L.; and Baltzer, William W., 4,445,924, Cl. 65-182.300.
Tongel, Richard R., 4,445,775, Cl. 355-122.000.

Pratap, Prem, to Coppus Engineering Corporation. Overspeed trip mechanism. 4,445,392, Cl. 74-3.000.

Preuss, Wolfgang, to Henkel KGaA. Process for degrading the 20-carboxyl group of Δ4-Steroid-20-carboxylic acids. 4,446,072, Cl. 260-397.450.

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Price, John K. Reading and spelling aid. 4,445,864, Cl. 434-173.000.

Prince Albert Pulp Company Limited: *See*—
Hyde, Bruce; Tyndall, Wayne; Abernethy, Dennis; and Mellgren, Per G., 4,445,552, Cl. 144-3.00D.

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Filka, Karel; Coupek, Jiri; and Kocourek, Jan, 4,446,275, Cl. 525-54.100.

Process Combustion Corporation: *See*—
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Process Development, Inc.: *See*—
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Procter & Gamble Company, The: *See*—
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,033, Cl. 252-8.600.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,035, Cl. 252-8.800.
Leslie, Kenneth A., 4,446,042, Cl. 252-102.000.
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Pyle, Ronald E. Home security system. 4,446,454, Cl. 340-538.000.

Pyne, Melvin L.; and Allsup, Robert B. Method and apparatus for sorting, counting and flattening cans. 4,445,430, Cl. 100-35.000.

Quack, Erich: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

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Raidel, John E. Suspension system with parallelogram axle stabilization and central elastomer spring. 4,445,707, Cl. 280-687.000.

Rainey, Judson C. Marble playing court. 4,445,689, Cl. 273-118.00R.

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Ranby, Peter W.; and Palowkar, David R., to Thorn Emi Limited. Luminescent materials. 4,446,048, Cl. 252-301.40S.

Rankel, Lillian A.: *See*—
Chen, Nai Y.; Rankel, Lillian A.; and Rudnick, Leslie R., 4,446,004, Cl. 208-57.000.

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Rasmussen, Lauritz B. L., to Superfos Glasuld A/S (Superfos A/S). Building element. 4,446,186, Cl. 428-74.000.

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Ray, Donald R.; and Facey, Eugene R., to Sonat Offshore Drilling Inc. Jack-up platform variable bearing assembly. 4,445,805, Cl. 405-203.000.

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Faulkner, Richard D.; Thoman, Daniel L.; and McDonie, Arthur F., 4,446,401, Cl. 313-533.000.
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Maehl, Ronald C., 4,446,466, Cl. 343-877.000.
Musselman, Elvin M., 4,446,398, Cl. 313-390.000.
Ottos, James G., 4,445,872, Cl. 445-3.000.
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Remus, Hans-Jurgen; and Antognini, Luciano-Marco, to Asulab S.A. Method for reducing the consumption of a stepping motor and device for carrying out the method. 4,446,413, Cl. 318-696.000.
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Reyes, Daniel. Super bike. 4,445,702, Cl. 280-239.000.
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Reynolds, Frederick W., III; Miranda, Robert E.; and Fabian, Roger C., to TRW Inc.; and TRW Inc. Apparatus and method for filling holes in a circuit board. 4,445,952, Cl. 156-94.000.
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Ribaud, Yves J.; and Kergreis, Gilbert F., to Office National d'Etudes et de Recherches Aerospatiales. Supersonic compressor with improved operation range. 4,445,816, Cl. 415-181.000.
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Rieder, Werner; and Fehrle, Martin, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Novel polyesters coated on conductive substrate. 4,446,195, Cl. 428-458.000.
Riemann, Hanns-Helmut; and Sonnenschein, Hans, to Mannesmann Veba Umwelttechnik GmbH. Process for the treatment of the combustible portion of domestic waste for briquetting and apparatus therefor. 4,445,906, Cl. 44-1.00D.
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Rigby, Ronald. Automatic injector for hypodermic syringes or the like and lancet holder for use in conjunction with an automatic injector. 4,445,510, Cl. 128-329.00R.
Riggin, Steven R. Aircraft flight computer. 4,446,361, Cl. 235-78.00N.
Riley, Richard L., to William H. Rorer, Inc. Method of treating congestive heart failure. 4,446,152, Cl. 424-322.000.
Rimmi, Pentti I., to Oy Helo Tehtaat. Electric sauna heater. 4,446,356, Cl. 219-272.000.
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Baker, Richard A.; Forsythe, George D.; Likhyani, Kewal K.; Roberts, Robert E.; and Robertson, David C., 4,446,024, Cl. 210-500.200.
Robinson, Harold L., to Donaldson Company, Inc. Magnetic filtration in a spin-on fluid filter. 4,446,019, Cl. 210-223.000.
Robinson, James W., to Flex-Kleen Corporation. Dust collector filter cartridge and structure for attachment suspending same from baghouse tube sheet. 4,445,915, Cl. 55-378.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers. 4,445,726, Cl. 308-3.800.
Rockwell International Corporation: *See*—
Apel, Thomas R., 4,446,445, Cl. 330-269.000.
Bonham, Harry B., Jr., 4,445,633, Cl. 228-102.000.
Fowks, William R., 4,446,446, Cl. 331-3.000.
Runyan, Wesley G., 4,446,527, Cl. 364-558.000.
Sullivan, William C.; and Nimberger, Spencer M., 4,445,400, Cl. 74-711.000.
von Bieren, Karlheinz, 4,446,559, Cl. 372-95.000.
Wallace, Keith L., 4,445,740, Cl. 339-45.00M.
Roder, Manfred, to Smithers Oassis GmbH & Co. KG. Base for inserting flowers, twigs and similar items. 4,445,298, Cl. 47-41.120.
Rodgers, Ned: *See*—
Olson, Wallace F.; and Rodgers, Ned, 4,445,265, Cl. 29-447.000.
Rodgers, Richard W., to McDonnell Douglas Corporation. Complementary metal oxide semiconductors address drive circuit. 4,446,536, Cl. 365-230.000.
Rodier, Raymond: *See*—
Raj, Kuldip; Moskowitz, Ronald; and Rodier, Raymond, 4,445,696, Cl. 277-80.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Tabless sanitary napkin. 4,445,900, Cl. 604-389.000.
Rogers, Gerald: *See*—
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,446,514, Cl. 364-200.000.
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell; and Sahatjian, Ronald A., to Polaroid Corporation. Optical device including birefringent polymer. 4,446,305, Cl. 528-348.000.

Rogers, Lloyd W., Jr., to General Motors Corporation. Clutch drive for power belt system. 4,445,604, Cl. 192-71.000.

Rohm and Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,445,930, Cl. 71-105.000.
Gleim, Robert D., 4,446,310, Cl. 528-487.000.

Rohner, Joachim; and Zumfeld, Heinz, to W. Schlafhorst & Co. Device for tying a first thread to a second thread by splicing with pressure gas. 4,445,319, Cl. 57-22.000.

Rohner, Joachim: *See—*
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

Rollen, Donald C.: *See—*
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,446,173, Cl. 427-206.000.

Rolls-Royce Limited: *See—*
Lind, David J.; and Richards, Joyce, 4,445,951, Cl. 156-93.000.

Romanek, Gerald A., to Phillips Petroleum Company. Textured nonwoven textile fabric laminate and process of making said. 4,446,189, Cl. 428-152.000.

Romanenkov, Jury A.: *See—*
Onischin, Boris P.; Linev, Valery D.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Keller, Viktor R.; Chernyshev, Ivan S.; Lakisov, Viktor V.; Moiseev, Valentin P.; Romanenkov, Jury A.; and Khakimov, Tamerlan G., 4,445,932, Cl. 75-11.000.

Roquette Freres: *See—*
Verwaerde, Francoise; Gosset, Serge; and Huchette, Michel, 4,445,938, Cl. 127-29.000.

Rosch, Reinhard W., to Northern Telecom Limited. Telephone lines status sensor. 4,446,338, Cl. 179-18.0FA.

Rose, John B.; and Cinderey, Michael B., to Imperial Chemical Industries PLC. Aromatic etherketone/sulphone copolymers. 4,446,294, Cl. 528-128.000.

Rosen, Klaus: *See—*
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

Rosenbaum, Herman S.: *See—*
Cheng, Bo-Ching; Rosenbaum, Herman S.; and Armijo, Joseph S., 4,445,942, Cl. 148-6.300.

Rosenquist, Niles R., to General Electric Company. Acyloxy terminated polycarbonates. 4,446,296, Cl. 528-198.000.

Ross, Charles O.: *See—*
Lisica, Vincent M.; and Ross, Charles O., 4,445,796, Cl. 400-120.000.

Rossiter, Paul H., to Welding Engineers, Inc. Apparatus and method for extracting fluid from an extruded material. 4,446,094, Cl. 264-349.000.

Roszkowski, Gregory J. Disposable cutting edge. 4,445,315, Cl. 56-295.000.

Roth, Eldon N. Method for forming bacon-like products. 4,446,159, Cl. 426-249.000.

Rothaar, Bruce C.: *See—*
Stockham, Thomas G., Jr.; and Rothaar, Bruce C., 4,446,494, Cl. 360-73.000.

Rouanes, Phillipe, to Siemens Aktiengesellschaft. Ignition system for internal-combustion engines. 4,445,492, Cl. 123-606.000.

Rouaud, Yvon: *See—*
Devault, Michel; Quinquis, Jean-Paul; and Rouaud, Yvon, 4,446,555, Cl. 370-94.000.

Rowley, William W. Plastic tube coupling and apparatus for forming. 4,446,084, Cl. 264-40.600.

Royer, Michel E., to Dupont, S. T. Process for producing a design composed of two different materials on the surface of an object. 4,445,982, Cl. 204-18.100.

Royer, Michele, to Honeywell Inc. Piezoelectric pressure sensor. 4,445,384, Cl. 73-724.000.

Rubber-en Kunststoffabriek ENBI B.V.: *See—*
Delhaes, Johannes C., 4,445,257, Cl. 29-117.000.

Rubin, Arnold: *See—*
Leaf, Sallie; and Rubin, Arnold, 4,445,720, Cl. 296-37.120.

Rubin, Harvey, to Bell Telephone Laboratories, Incorporated. Mechanized testing of subscriber facilities. 4,446,341, Cl. 179-175.20R.

Rubin, Robert. Hosiery with included pocket. 4,445,233, Cl. 2-239.000.

Rubner, Roland: *See—*
von Gentzkow, Wolfgang; and Rubner, Roland, 4,446,266, Cl. 524-193.000.

Rudnick, Leslie R.: *See—*
Chen, Nai Y.; Rankel, Lillian A.; and Rudnick, Leslie R., 4,446,004, Cl. 208-57.000.

Ruff, Henry C. Leg stretching machine. 4,445,684, Cl. 272-134.000.

Ruhrchemie Aktiengesellschaft: *See—*
Hobes, John; Payer, Wolfgang; and Deymann, Detlef, 4,446,311, Cl. 528-493.000.

Ruhrkohle AG: *See—*
Bassier, Friedr.; Adrian, Fritz; and Deuster, Dieter, 4,445,937, Cl. 106-109.000.

Rule, Mark: *See—*
Moore, Louis D.; Rule, Mark; and Wicker, Thomas H., 4,446,303, Cl. 528-308.200.

Runyan, Wesley G., to Rockwell International Corporation. High accuracy measuring apparatus. 4,446,527, Cl. 364-558.000.

Russell, Dean E.; and Russell, Tom H., to Russell & Sons Construction Co. Inc. Bulldozer blade. 4,445,577, Cl. 172-701.300.

Russell, Peter J.: *See—*
Hombach, Rudolf; Nolte, Wilfried; Russell, Peter J.; and Wall, Nigel G., 4,445,959, Cl. 156-332.000.

Russell & Sons Construction Co. Inc.: *See—*
Russell, Dean E.; and Russell, Tom H., 4,445,577, Cl. 172-701.300.

Russell, Tom H.: *See—*
Russell, Dean E.; and Russell, Tom H., 4,445,577, Cl. 172-701.300.

Russenberger, Max E., to Russenberger Prufmaschinen AG. Device for testing the vibration strength of a test body. 4,445,381, Cl. 73-666.000.

Russenberger Prufmaschinen AG: *See—*
Russenberger, Max E., 4,445,381, Cl. 73-666.000.

Russo, Raimondo; and Liotta, Lance A., to United States of America, Health and Human Services. Vitro cellular interaction with amnion membrane substrate. 4,446,234, Cl. 435-29.000.

Rutkiewic, Andrew F.; and White, James P., to Du Pont de Nemours, E. I., and Company. Aqueous water-in-oil cleaning emulsion. 4,446,044, Cl. 252-170.000.

Rutt, Truman C.: *See—*
Scrantom, Dehart G.; and Rutt, Truman C., 4,445,851, Cl. 432-239.000.

Rutten, Leon L. Projectile for centrifugal launching device. 4,445,436, Cl. 102-501.000.

Sahatjian, Ronald A.: *See—*
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell; and Sahatjian, Ronald A., 4,446,305, Cl. 528-348.000.

Sahley, Lloyd W., to Syndrill Carbide Diamond Company. Deep hole rock drill bit. 4,445,580, Cl. 175-404.000.

Saho, Norihide; Koibuchi, Koji; Kasai, Kenjiro; and Higaki, Hiroshi, to Hitachi, Ltd. Scroll type laminated heat exchanger. 4,445,569, Cl. 165-165.000.

Saikosha Works Ltd.: *See—*
Saitoh, Hisashi, 4,445,348, Cl. 70-312.000.

Saint-Gobain Industries: *See—*
Dewitte, Jean; and Aymard, Pierre, 4,446,207, Cl. 428-402.000.

Saito, Tetsuya; and Mori, Hiroshi, to Daido Tokushuko Kabushiki Kaisha. Method of refining molten steel. 4,445,933, Cl. 75-59.000.

Saitoh, Hisashi, to Saikosha Works Ltd. Combination lock. 4,445,348, Cl. 70-312.000.

Sakaguchi, Katsuyoshi; and Hasegawa, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Drain discharge device in a tire curing machine. 4,445,834, Cl. 425-36.000.

Sakai, Masao; Hashizume, Miyakazu; Suzuki, Yasuhiko; and Sugimoto, Makoto, to NGK Spark Plug Co., Ltd. Resistor composition for resistor-incorporated spark plugs. 4,446,058, Cl. 252-507.000.

Sakamoto, Koji; and Kobayashi, Kazuo, to Ricoh Company, Ltd. Developing apparatus for electrostatic photography. 4,445,771, Cl. 355-3.0DD.

Sakaue, Tatsuo: *See—*
Iida, Tetsuya; and Sakaue, Tatsuo, 4,446,567, Cl. 377-79.000.

Sakuma, Shinzo: *See—*
Kashimoto, Yutaka; Sakuma, Shinzo; and Umeya, Eiji, 4,446,346, Cl. 200-144.00B.

Sakutori, Eric M. Footwear with integral cushioning and ventilating apparatus. 4,445,284, Cl. 36-3.00B.

Sale, Francis M.: *See—*
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,445,926, Cl. 71-34.000.

Salm, Dietmar F. E., to Broken Hill Proprietary Company Limited, The. Manufacture of tinplate and tinplate containers. 4,446,156, Cl. 428-648.000.

Samanta, Sudarsan C., to General Refractories Company. Strong, heat stable, water repellent, expanded perlite/alkali metal silicate insulation material. 4,446,040, Cl. 252-62.000.

Samuelson, Hans O., to Mo och Domsjo Aktiebolag. Process for the delignifying bleaching of cellulose pulp by activating the pulp with NO_2 and oxygen. 4,445,969, Cl. 162-40.000.

Sandberg, Christopher T., to Truth Incorporated. Self-locking threaded bearing and bearing assembly and method of making such assembly. 4,445,794, Cl. 384-428.000.

Sander, Lars: *See—*
Brogardh, Torgny; Ovren, Christer; and Sander, Lars, 4,446,366, Cl. 250-227.000.

Sanders, Anthony J., to Black & Decker Inc. Setting mechanisms especially for tools for carrying out routing and like operations. 4,445,811, Cl. 409-182.000.

Sanders Associates, Inc.: *See—*
Fuller, Harrison W., 4,446,566, Cl. 375-96.000.

Sandhorst, Bruce C.: *See—*
Twersky, Marvin; Splinter, William E.; and Sandhorst, Bruce C., 4,445,788, Cl. 374-142.000.

Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., to Eastman Kodak Company. Electrostatographic developers comprising toners containing a polyester having p-hydroxybenzoic acid recurring units. 4,446,302, Cl. 528-302.000.

Sands, Robert W., to General Electric Company. Automotive lamp unit. 4,446,511, Cl. 362-267.000.

Sangha, Parminder: *See—*
Dix, Peter; Pogany, George A.; and Sangha, Parminder, 4,446,313, Cl. 536-18.600.

Sano, Shinichi: *See—*
Yamaguchi, Keiki; Takeuchi, Yasuhito; Sano, Shinichi; and Higashiizumi, Takao, 4,445,379, Cl. 73-631.000.

Sano, Yoshiaki: *See—*
Kishimoto, Satoru; Atsumi, Masaharu; and Sano, Yoshiaki, 4,446,499, Cl. 361-92.000.

Santa Fe International Corporation: *See*—
Angel, Thomas M., 4,445,524, Cl. 134-113.000.

Sapi, Janos: *See*—
Szantay, Csaba; Szbao, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, 4,446,139, Cl. 424-256.000.

Sasaki, Takeshi; Akiba, Kiyoshi; and Takahashi, Yoshio, to Honda Giken Kogyo Kabushiki Kaisha. Process for balancing a crankshaft. 4,445,399, Cl. 74-603.000.

Sasaki, Takuji: *See*—
Niwa, Senji; Sasaki, Takuji; Shinto, Masaaki; and Imamura, Noriaki, 4,446,250, Cl. 502-309.000.

Sasaki, Toshio: *See*—
Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, 4,445,279, Cl. 33-356.000.

Sasson Jeans, Inc.: *See*—
Benarrouch, Jacques, 4,445,609, Cl. 206-277.000.

Sato, Hiroshi: *See*—
Mitsumori, Mitsugi; Hosaka, Hiroaki; Sato, Hiroshi; and Kondou, Kouichi, 4,445,614, Cl. 206-599.000.

Sato, Kiyoshi; Terashima, Minoru; Sorimachi, Haruo; Naka, Toshiaki; Kanno, Takeo; and Yamada, Fumiaki, to Fujitsu Limited. Crossover construction of thermal-head and method of manufacturing same. 4,446,355, Cl. 219-216.000.

Sato, Makoto; Ohmori, Taiji; and Tsuchiya, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Method of preventing skid of wheels of a vehicle. 4,446,522, Cl. 364-426.000.

Sato, Yoshihiro, to Dai Nippon Insatsu K.K.; and Victor Company of Japan, Ltd. Flank sheet of packaging case for video tape cassette. 4,445,634, Cl. 229-40.000.

Satoyama, Kenichiro: *See*—
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, 4,446,410, Cl. 318-687.000.

Satterfield, Larry S., to Milliken Research Corporation. Apparatus to measure yarn tension. 4,445,322, Cl. 57-264.000.

Sauber, Charles J. Cable feeding system. 4,445,668, Cl. 254-287.000.

Sauer, Anton; and Witte, Hans H., to Siemens Aktiengesellschaft. Passive bus system for decentrally organized multi-computer systems. 4,446,515, Cl. 364-200.000.

Saunders, William T., to Stoffel Technologies, Inc. Easy-open container wall. 4,445,621, Cl. 220-273.000.

Savagian, Michael D., to W. H. Brady Co. Tag with attached fold-over transparent cover element. 4,446,183, Cl. 428-42.000.

Sawa, John J.: *See*—
Tilly, Lynn K.; and Sawa, John J., 4,445,439, Cl. 105-165.000.

Sawada, Tohru, to Eisai Co., Ltd. Method for treatment of arthrosis deformans with elastase. 4,446,129, Cl. 424-94.000.

Scal Societe de Conditionnements en Aluminium: *See*—
Scheidegger, Albert, 4,445,310, Cl. 53-485.000.

Schaetzer, Harry; Raisin, Helmut; Mauserahl, Dieter; and Ciba-Geigy AG. Process for trichromatic dyeing or printing of polyamide. 4,445,905, Cl. 8-641.000.

Schanin, David J.: *See*—
Moore, Russell L.; and Schanin, David J., 4,446,382, Cl. 307-241.000.

Schaper, Dieter, to General Motors Corporation. Seat belt latch for rear seats. 4,445,722, Cl. 297-468.000.

Schauffele, Roy F., to Carlisle Corporation. Mechanically attached roofing system. 4,445,306, Cl. 52-410.000.

Scheerhorn, Douglas, to Steelcase Inc. Over-centered lock arrangement for office furniture units. 4,445,729, Cl. 312-219.000.

Scheidegger, Albert, to Scal Societe de Conditionnements en Aluminium. Process and installation for supplying caps to a closure machine. 4,445,310, Cl. 53-485.000.

Schering Aktiengesellschaft: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,446,147, Cl. 424-274.000.

Schiele, Bernd; and Niedermeier, Johann, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Apparatus for supporting crystalline wafers. 4,445,494, Cl. 125-35.000.

Schilling, Hugh K., to Horton Industries, Inc. Spring engaged fluid released fan clutch for a live shaft. 4,445,605, Cl. 192-91.00A.

Schillinger, Bernhard: *See*—
Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, 4,446,253, Cl. 521-79.000.

Schillinger, Ekkehard: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,446,147, Cl. 424-274.000.

Schirmann, Peter J.: *See*—
Cady, Susan M.; Blank, Werner J.; and Schirmann, Peter J., 4,446,280, Cl. 525-186.000.

Schlag, Rudolf: *See*—
Weiler, Rolf; Bischoff, Gilbert; and Schlag, Rudolf, 4,445,331, Cl. 60-547.100.

Schleicher, Siegfried: *See*—
Ebermann, Joachim; Graf, Heinz; Schleicher, Siegfried; and Uhlig, Jurgen, 4,446,408, Cl. 318-600.000.

Schlicht, Raymond C.; and Skrobul, Anthony P., to Texaco, Inc. Citric imide acid compositions and lubricants containing the same. 4,446,038, Cl. 252-51.50A.

Schmid, Rolyn A., to Bender Machine Works, Inc. Apparatus for cleaning liquid conveying system and control valve assembly therefor. 4,445,522, Cl. 134-58.00R.

Schmidt, Frederick A.; Rehbein, David; and Chiotti, Premo, to United States of America, Energy. Method of preparing silicon from sodium fluosilicate. 4,446,120, Cl. 423-350.000.

Schmidt, Frederick C., to Lipe Rollway Corporation. Self adjusting release mechanism for clutch. 4,445,600, Cl. 192-18.00R.

Schmidt, Henry, Jr., to Industrial Filter & Pump Mfg. Co. Liquid circulation and pressure tanks. 4,446,030, Cl. 210-805.000.

Schmidt, Leon W.: *See*—
Nelson, Larry A.; and Schmidt, Leon W., 4,446,106, Cl. 422-72.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. 4-Arylbis 2,6-(aminophenyl)pyridines. 4,446,321, Cl. 544-124.000.

Schmiel, Herbert H., to Dana Corporation. Hydraulic remote control joystick. 4,445,541, Cl. 137-636.200.

Schmitt, Gunther: *See*—
Oppl, Gunter; and Schmitt, Gunther, 4,445,320, Cl. 57-88.000.

Schmitz, Eckehard: *See*—
Baumgartner, Hans; and Schmitz, Eckehard, 4,445,475, Cl. 123-339.000.

Schmitz, Heinz: *See*—
Divisek, Jiri; and Schmitz, Heinz, 4,445,994, Cl. 204-258.000.

Schmitz, Werner; and Simon, Edgar, to Degussa Aktiengesellschaft. Apparatus for emptying containers filled with powder. 4,445,809, Cl. 406-152.000.

Schnalke, Karl-Erwin: *See*—
Konig, Joachim; Schnalke, Karl-Erwin; Suling, Carlhans; and Horacek: Gotz, 4,446,291, Cl. 526-209.000.

Schneider, Werner, to Deere & Company. Mounting means for a steering cylinder. 4,445,586, Cl. 180-132.000.

Schnoring, Hildegard: *See*—
Bucheler, Manfred; Klinksiek, Bernd; Gehringer, Hans; and Schnoring, Hildegard, 4,446,127, Cl. 424-59.000.

Scholz, John A., to GTE Products Corporation. Photoflash lamp. 4,445,847, Cl. 431-362.000.

Scholz, Romanus: *See*—
Hofbauer, Peter; Heidemeyer, Paulus; and Scholz, Romanus, 4,445,601, Cl. 192-48.800.

Schouwenaars, Hendrikus J.: *See*—
van de Plassche, Rudy J.; Dijkmans, Eise C.; and Schouwenaars, Hendrikus J., 4,446,419, Cl. 323-316.000.

Schrati, John F.; and Weber, Joseph J., to United Technologies Corporation. Apparatus for cryogenic proof testing of rotating parts. 4,445,790, Cl. 374-45.000.

Schreuder, Hermann A.: *See*—
Molenaar, Maarten; and Schreuder, Hermann A., 4,446,086, Cl. 264-118.000.

Schrier, Eugene E.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,446,103, Cl. 422-37.000.

Schroeder, Warren C. Highway transport truck tire water splash shield. 4,445,700, Cl. 280-154.50R.

Schroendorfer, Donald W., to Haemonetics Corporation. Deformable support for fluid processing centrifuge. 4,445,883, Cl. 494-21.000.

Schucker, Robert C.: *See*—
Wheelock, Kenneth S.; and Schucker, Robert C., 4,446,011, Cl. 208-121.000.

Schussler, Hans H.: *See*—
Voneky, Geza; and Schussler, Hans H., 4,445,276, Cl. 33-168.00R.

Schwab, Frederick C., to Mobil Oil Corp. Adhesive composition, film laminate and product pouch or tube therefrom. 4,446,180, Cl. 428-35.000.

Schwaerzler, Hans, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method for the landing of air and spacecrafts. 4,445,653, Cl. 244-110.00D.

Schwalm, Donald J., to Holcroft & Company. Method of controlling furnace atmospheres. 4,445,945, Cl. 148-16.000.

Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., to Schering Aktiengesellschaft. Azaprostacyclins, their preparation and pharmaceutical use. 4,446,147, Cl. 424-274.000.

Schwarz, Richard A., to Cosden Technology, Inc. Expandable polystyrene composition and process. 4,446,208, Cl. 428-407.000.

Schwenk, Gerhard: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,446,204, Cl. 428-323.000.

Schwind, Jacques; and Le Feuvre, Camille, to Framatome. Device for protecting control cluster actuating mechanisms during the testing of a nuclear reactor. 4,446,099, Cl. 376-277.000.

Scrantom, Dehart G.; and Rutt, Truman C., to AVX Corporation. Apparatus and method for firing ceramic articles or the like. 4,445,851, Cl. 432-239.000.

Sebbah, Jack: *See*—
Viannay, Stephane; Germain, Alfred; and Sebbah, Jack, 4,445,525, Cl. 134-122.00R.

Sedig, Albert R.; and Ingham, Francis H., to ITT Corporation. High pressure electrical connector. 4,445,744, Cl. 339-94.00M.

Seeburg, Peter H., to Genentech, Inc. Method for cloning human growth hormone varient genes. 4,446,235, Cl. 435-91.000.

Seeney, Charles E.; and Kraemer, John F., to International Minerals & Chemical Corp. Process for preparing cores and molds. 4,445,565, Cl. 164-528.000.

Segan, Ellen G.: *See*—
Kumar, Ashok; Segan, Ellen G.; Bukowski, John M.; and Helgeland, Jon L., 4,445,989, Cl. 204-147.000.

Seguin, Serge: *See*—
Kubic, Nick; Bell, Claude; and Seguin, Serge, 4,445,619, Cl. 220-263.000.

Seidl, Allen W., to Tate, Thomas B., a part interest. Paint case. 4,445,250, Cl. 15-257.060.
Seikagaku Kogyo Co., Ltd.: *See*—
Noyori, Ryoji; Suzuki, Sakaru; and Okayama, Minoru, 4,446,312, Cl. 536-1.100.
Seitz-Werke GmbH: *See*—
Bernhard, Herbert, 4,445,549, Cl. 141-148.000.
Sekiguchi, Kiyonori: *See*—
Tanaka, Takeshi; Kawai, Hisai; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.
Sekine, Yasuhiro; Kuwayama, Masayuki; and Harada, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Rotating electric machinery. 4,446,391, Cl. 310-62.000.
Sekiya, Shinji; and Ono, Takatoshi, to Disco Co., Ltd. Method for grinding flat plates. 4,445,300, Cl. 51-283.00R.
Selby, Theodore W. Tapered bearing simulator-viscometer. 4,445,365, Cl. 73-60.000.
Self, Colin H. Immunoassay using an amplified cyclic detection system. 4,446,231, Cl. 435-7.000.
Selleck, Franklin G., to United Technologies Corporation. Instrumentation for a rotary machine. 4,446,461, Cl. 340-870.320.
Sellon, Jeffrey, to Cuisenaire Company of America, Inc. Method of teaching mathematics. 4,445,865, Cl. 434-207.000.
Selon Co., Ltd.: *See*—
Serizawa, Jiro, 4,445,845, Cl. 431-295.000.
Sentinger, Egon: *See*—
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Serber, Stephen L.: *See*—
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Shah, Syed M. M.; Lukaas, Anthony J.; and Ahmed, Salah E., to Beatrice Foods Co. Modifier for effecting physical properties of food and food grade compositions. 4,446,055, Cl. 252-351.000.
Shannon, Suel G.: *See*—
Long, William B.; and Shannon, Suel G., 4,446,505, Cl. 361-413.000.
Sharp Kabushiki Kaisha: *See*—
Endo, Yoshihiro; Kawaguchi, Masashi; Mizukami, Etsuo; and Kishishita, Hiroshi, 4,446,399, Cl. 313-505.000.
Tanaka, Atsuo, 4,446,531, Cl. 364-728.000.
Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,445,997, Cl. 204-298.000.
Shaw, Graham C., III; and Reed, Russell, Jr., to Thiokol Corporation. Low cost fluorocarbon flare compositions. 4,445,947, Cl. 149-19.300.
Sheiry, William G., to Eaton Corporation. Seat switch assembly. 4,446,345, Cl. 200-85.00R.
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Cowles, Christopher S., 4,446,541, Cl. 367-75.000.
Den Hartog, Arie P., 4,446,112, Cl. 422-216.000.
Dix, Peter; Pogany, George A.; and Sangha, Parminder, 4,446,313, Cl. 536-18.600.
Kooijmans, Petrus G.; and Kunze, Wolfgang, 4,446,257, Cl. 523-403.000.
Shell Research Limited: *See*—
Mead, Howard B., 4,445,543, Cl. 138-122.000.
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., to Goodyear Tire & Rubber Company, The. Copper-zinc-iron ternary alloy coated steel wire reinforcers in tires. 4,446,198, Cl. 428-625.000.
Shepherd, Warren R. Self-locking box for tape cassettes and information flap. 4,445,612, Cl. 206-387.000.
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Bodicky, Raymond O., 4,445,893, Cl. 604-165.000.
Shetterly, Donivan M., to Owens-Illinois, Inc. Position sensing device. 4,445,923, Cl. 65-158.000.
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Shibata, Toshiaki: *See*—
Ohsawa, Kazuya; Shibata, Toshiaki; and Takahashi, Kenichi, 4,445,755, Cl. 350-96.340.
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Shigeta, Katsunori; Nakamura, Takashi; Maruyama, Hisaichi; and Matsumoto, Yasuji, to Mitsubishi Denki Kabushiki Kaisha. Process of preparing and processing sewing data for an automatic sewing machine. 4,446,520, Cl. 364-400.000.
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Shimakawa, Hajime; and Nakai, Satoshi, to Research Association for Residual Oil Processing. Process for hydrocracking of heavy oils with iron containing aluminosilicates. 4,446,008, Cl. 208-111.000.
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Shimano, Keizo, 4,445,396, Cl. 74-551.100.
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Shinriki, Tatsuo, to Height, Inc. Process for making a composite edible product. 4,446,160, Cl. 426-297.000.
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Shioda Dental Manufacturing Co., Ltd.: *See*—
Hobo, Sumiya; and Okamoto, Koji, 4,445,855, Cl. 433-59.000.
Shipp, Kenneth O., Jr.: *See*—
Levine, Lewis J.; and Shipp, Kenneth O., Jr., 4,445,795, Cl. 400-63.000.
Shirazawa, Takashi: *See*—
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Shirk, James E., to Wilmington Chemical Corporation. Tire cord adhesive composition. 4,446,307, Cl. 528-406.000.
Shofu, Koichi, to Design Applications Incorporated. Package for dental drills and the like. 4,445,611, Cl. 206-369.000.
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Long, William B.; Metzger, Donald L.; and Shuey, John R., 4,445,737, Cl. 339-18.00C.
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Lazar, John D., Jr.; and Shvartsman, Benyamin, 4,445,410, Cl. 83-390.000.
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Siecor Corporation: *See*—
Coleman, John D.; Obst, Donald L.; and Kraft, Heinrich A., 4,445,593, Cl. 187-1.00R.
Siegmund, Charles W., to Exxon Research and Engineering Co. Process for suppressing precipitation of sediment in unconverted residuum from virgin residuum conversion process. 4,446,002, Cl. 208-23.000.
Siemens Aktiengesellschaft: *See*—
Bardl, Artur, 4,446,485, Cl. 358-213.000.
Brajder, Antonio; and Kublick, Christian, 4,446,550, Cl. 370-14.000.
Franke, Kurt, 4,446,569, Cl. 378-115.000.
Rouanes, Phillipe, 4,445,492, Cl. 123-606.000.
Sauer, Anton; and Witte, Hans H., 4,446,515, Cl. 364-200.000.
von Gentzkow, Wolfgang; and Rubner, Roland, 4,446,266, Cl. 524-193.000.
Siemens-Allis, Inc.: *See*—
Stich, Frederick A., 4,446,498, Cl. 361-87.000.
Siemens Gammasonics, Inc.: *See*—
Guth, William R., 4,446,570, Cl. 378-149.000.
Sig Societe Industrielle Suisse: *See*—
Nielsen, Arne, 4,445,437, Cl. 104-12.000.
Signet Scientific Co.: *See*—
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Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Herbicidal aminosulfenamide derivatives of N-phosphonomethylglycine triesters. 4,445,928, Cl. 71-87.000.
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Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., to Du Pont de Nemours, E. I., and Company. Solvents of carboxyl ester compounds and fluoropolymers. 4,446,269, Cl. 524-316.000.
Silverstein, Seth D.: *See*—
Johnson, Peter D.; and Silverstein, Seth D., 4,446,397, Cl. 313-25.000.
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Simms, John A.: *See*—
Brixius, Darryl W.; and Simms, John A., 4,446,175, Cl. 427-385.500.
Simms, John T. Pair of eyeglasses. 4,445,760, Cl. 351-95.000.
Simon, Edgar: *See*—
Schmitz, Werner; and Simon, Edgar, 4,445,809, Cl. 406-152.000.
Simons, Joseph A. G.: *See*—
Van Brussel, Hendrik M.; and Simons, Joseph A. G., 4,445,273, Cl. 29-714.000.
Simplex Time Recorder Co.: *See*—
Franke, George, 4,446,468, Cl. 346-82.000.
Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., to Union Oil Company of California. Hydrotreating catalyst. 4,446,248, Cl. 502-211.000.

Singer Company, The: *See*—
Albert, William C., 4,446,394, Cl. 310-321.000.
Singh, Prithipal: *See*—
Lin, Cheng-I; and Singh, Prithipal, 4,446,065, Cl. 260-112.00R.
Sivulka, Gerald M., to Kelsey Hayes Company. Vehicle hydraulic brake system and apparatus. 4,445,725, Cl. 303-6.00C.
Skega AB: *See*—
Andersson, Albert, 4,445,582, Cl. 180-9.500.
Skrobul, Anthony P.; and Kaufman, Benjamin J., to Texaco Inc. Beta-amino acid derivatives and friction-modified lubricating compounds containing same. 4,446,053, Cl. 252-33.600.
Skrobul, Anthony P.: *See*—
Schlicht, Raymond C.; and Skrobul, Anthony P., 4,446,038, Cl. 252-51.50A.
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Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,446,147, Cl. 424-274.000.
Skuya, Agris Z.: *See*—
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Slavin, Morton A.: *See*—
Goebel, Franz; and Slavin, Morton A., 4,446,211, Cl. 429-101.000.
Slot, Gys H.: *See*—
Ulrich, Bernhard; and Slot, Gys H., 4,445,513, Cl. 128-69.000.
Slover, Pearl; and Moore, Robert R. Stool specimen collector. 4,445,235, Cl. 4-144.200.
Smagala-Romanoff, Edward A., to ID Code Industries, Inc. Identification devices and methods. 4,445,712, Cl. 283-75.000.
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Southgate, Robert; Smale, Terence C.; and Ponsford, Roger J., 4,446,146, Cl. 424-274.000.
Smallwood, Peter V.; and Zichy, Erno L., to Imperial Chemical Industries PLC. Production of vinyl chloride polymers. 4,446,287, Cl. 526-81.000.
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Smith, Burl L.; and Kearby, Ronald S., to Teepak, Inc. Food casing which will transfer a smoke color and flavor to food encased therein and basic natural liquid smoke for use therewith. 4,446,167, Cl. 426-650.000.
Smith, Burrell, to Apple Computer, Inc. Digital, simultaneous, discrete frequency generator. 4,445,414, Cl. 84-1.010.
Smith, Craig G., to Bell Telephone Laboratories, Incorporated. Copper electroplating procedure. 4,445,980, Cl. 204-15.000.
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Smith, Derek J.: *See*—
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Smith, Frederick J., to National Semiconductor Corporation. Programmable fuse circuit. 4,446,534, Cl. 365-96.000.
Smith, Fritz A., to Mobil Oil Corporation. Hydrodewaxing. 4,446,007, Cl. 208-111.000.
Smith International, Inc.: *See*—
Olson, Wallace F.; and Rodgers, Ned, 4,445,265, Cl. 29-447.000.
Smith, Norman A.; Postle, Stephen R.; and Long, William E. Photographic material. 4,446,216, Cl. 430-405.000.
Smith, Peter H., to General Electric Company. Microwave phase shifting device. 4,446,349, Cl. 219-10.55F.
Smith, Rex L., to United States of America, Navy. Method of making glass-to-metal seal (header). 4,445,920, Cl. 65-59.210.
Smith, Roger A.: *See*—
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,446,269, Cl. 524-316.000.
Smith, Vigo N., to Measurex Corporation. System and process for calibrating a combustion gas analyzer. 4,445,359, Cl. 73-1.00G.
Smithers Oassis GmbH & Co. KG: *See*—
Roder, Manfred, 4,445,298, Cl. 47-41.120.
Snyder, William R.; and Feuerstein, Diane, to Betz Laboratories, Inc. Composition for treating aqueous mediums. 4,446,045, Cl. 252-180.000.
Socapex: *See*—
Collignon, Roger, 4,445,753, Cl. 350-96.210.
Societa Impianti Elettrici Telefonici Telegrafici e Costruzioni Edili S.p.A.: *See*—
Brambilla, Guido, 4,445,598, Cl. 188-322.160.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
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Societe Anonyme DBA: *See*—
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Societe Breilly S.A.: *See*—
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Societe Generale pour l'Industrie Electronique (S.O.G.I.E.): *See*—
Cartesae, Georges, 4,445,745, Cl. 339-177.00R.
Solimeno, Duane: *See*—
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,446,514, Cl. 364-200.000.
Solmat Systems Ltd.: *See*—
Assaf, Gad; and Cohen, Yehuda, 4,446,025, Cl. 210-602.000.
Sonat Offshore Drilling Inc.: *See*—
Ray, Donald R.; and Facey, Eugene R., 4,445,805, Cl. 405-203.000.
Sone, Masazumi: *See*—
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Song, Hubert, to Verbatim Corporation. Optimum acceleration/deceleration circuit. 4,446,411, Cl. 318-696.000.
Sonnenschein, Hans: *See*—
Riemann, Hanns-Helmut; and Sonnenschein, Hans, 4,445,906, Cl. 44-1.00D.
Sontheimer, Karl, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,445,828, Cl. 417-490.000.
Sony Corporation: *See*—
Denholm, A. Stuart; Frutiger, William A.; and Williams, Kenneth E., 4,446,373, Cl. 250-492.200.
Hoshimi, Susumu; and Kojima, Tadashi, 4,446,490, Cl. 360-32.000.
Kimizuka, Masanori; and Yamanishi, Yoshio, 4,445,651, Cl. 242-199.000.
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Souma, Masahiro: *See*—
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Soundstream, Inc.: *See*—
Stockham, Thomas G., Jr.; and Rothaar, Bruce C., 4,446,494, Cl. 360-73.000.
Southgate, Robert; Smale, Terence C.; and Ponsford, Roger J., to Beecham Group Limited. β-Lactam containing compounds, their preparation and use. 4,446,146, Cl. 424-274.000.
Sparrow, Richard S., Jr., to Peerless Pressed Metal, Inc. Apparatus for shaking contained mixtures including paint and other fluid materials. 4,445,782, Cl. 366-217.000.
Speakman Company: *See*—
Lagarelli, Carmen J., 4,445,529, Cl. 137-360.000.
Spencer, Arthur T.: *See*—
Chu, Shaw C.; and Spencer, Arthur T., 4,446,258, Cl. 523-406.000.
Spencer Wright Industries, Inc.: *See*—
Bardsley, Harold B.; and Beverley, Ian, 4,445,447, Cl. 112-79.00R.
Sperber, Martin, to Intercept Corporation. Antenna rotator apparatus. 4,446,407, Cl. 318-282.000.
Sperry Corporation: *See*—
Currie, Thomas P.; and Goldberg, Norman, 4,446,477, Cl. 357-74.000.
Spinelli, Richard A.; and Glab, Edwin F., to Xerox Corporation. Document imaging system with improved exposure uniformity at image plane. 4,445,774, Cl. 355-71.000.
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Twersky, Marvin; Splinter, William E.; and Sandhorst, Bruce C., 4,445,788, Cl. 374-142.000.
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., to International Flavors & Fragrances Inc. Mono-oxomethyl substituted polyhydrodimethanonaphthalene derivatives, organoleptic uses thereof and processes for preparing same. 4,446,060, Cl. 252-522.00R.
Srivastava, Gopal K.; and Lai, Stephen H., to Zenith Radio Corporation. System for generating 2H pulses in a television receiver. 4,446,482, Cl. 358-150.000.
Stabilus GmbH: *See*—
Reuschenbach, Hermann; and Sentinger, Egon, 4,445,671, Cl. 267-64.120.
Stal-Labal Turbin AB: *See*—
Ekbom, Ragnar, 4,445,259, Cl. 29-156.80B.
Stamicarbon B.V.: *See*—
Gaymans, Reinoud J.; and van Asperen, Pieter J., 4,446,304, Cl. 528-335.000.
Standard Oil Company (Indiana): *See*—
Lautzenhiser, Theodore V., 4,445,371, Cl. 73-382.00R.
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Baachang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,446,128, Cl. 424-88.000.
Stanley Electric Co., Ltd.: *See*—
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Starimshak, Thomas W.: *See*—
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Stark, Martin H.; Pisani, George V.; and Pauquette, James J., to Arrow Paper Products Company. Method of producing a puzzle. 4,445,691, Cl. 273-155.000.
Staudinger, Alfons, to A. Rohe GmbH. Wheel alignment measuring apparatus, more specially for dynamic operation. 4,445,278, Cl. 33-203.120.
Stead, Eugene A., Jr.: *See*—
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,445,502, Cl. 128-25.00R.

Steag AG: *See*—
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Steelcase Inc.: *See*—
Scheerhorn, Douglas, 4,445,729, Cl. 312-219.000.
Steeves, Arthur F.; and Bibb, Albert E., to United States of America, Energy. Micrographic detection of plastic deformation in nickel base alloys. 4,445,988, Cl. 204-129.200.
Steffen, Cliff; and Cappelli, Nicholas P., to Purdue Frederick Company, The. Metering device for dispensing selected amounts of viscous material. 4,445,626, Cl. 222-39.000.
Steffen, Klaus-Dieter: *See*—
Weisgerber, Gregor; and Steffen, Klaus-Dieter, 4,446,327, Cl. 549-307.000.
Stein, Reinhardt P., to American Home Products Corporation. Hydroxyl protected 3-(2-hydroxy-2-phenylethyl)-N-[(phenylamino)carbonyl]sydnone imine intermediates. 4,446,322, Cl. 544-138.000.
Steinleitner, Gunther, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,446,213, Cl. 429-104.000.
Stejskal, Edward O., to Monsanto Company. Sample spinner for nuclear magnetic resonance spectrometer. 4,446,430, Cl. 324-321.000.
Stenberg, Erik G., to Aktiebolaget Karlstads Mekaniska Werkstad. Apparatus for forming a multilayer jet of paper making stock. 4,445,974, Cl. 162-300.000.
Stencil, Gerald R. Crowd gate for milking parlor. 4,445,460, Cl. 119-20.000.
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Sterling Drug Inc.: *See*—
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Margulies, Herman, 4,445,895, Cl. 604-193.000.
Schmidt, Paul J.; and Hung, William M., 4,446,321, Cl. 544-124.000.
Stern, Richard A., to United States of America, Army. Biasing magnet holder-tuning cap for dielectric waveguide circulator. 4,446,448, Cl. 333-1.100.
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., to Conoco Inc. Hydrocarbon prospecting method with changing of electrode spacing for the indirect detection of hydrocarbon reservoirs. 4,446,434, Cl. 324-363.000.
Sterrett, Richard L. Apparatus for fertilizing soil with a V-blade plow. 4,445,445, Cl. 111-7.000.
Stewart, Daniel R.: *See*—
Francel, Josef; Stewart, Daniel R.; and Horn, Uriah, 4,446,241, Cl. 501-14.000.
Stewart, Robert D.; and Taylor, Thomas E., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger having separating drain and method of operation thereof. 4,445,443, Cl. 110-245.000.
Stich, Frederick A., to Siemens-Allis, Inc. Electronic control system for overload relay or the like. 4,446,498, Cl. 361-87.000.
Stichting Kennisexploitatie Nederland: *See*—
Borst, Arnoldus J., 4,445,857, Cl. 433-75.000.
Stieff, Lorin R.; and Dempsey, John C., to Taggents, Inc. Method and apparatus for measuring air infiltration rate into buildings. 4,445,364, Cl. 73-40.700.
Stillings, Michael R., to Reckitt & Colman Products Limited. Benzodioxanyl imidazoline compounds, compositions and use. 4,446,148, Cl. 424-273.00R.
Stillwell, James R. Roller skate with user powered drive mechanism. 4,445,698, Cl. 280-11.115.
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Stirbis, James S., to Adolph Coors Company. Disk transfer system. 4,445,431, Cl. 101-40.000.
Stivers, David A.: *See*—
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Stockham, Thomas G., Jr.; and Rothaar, Bruce C., to Soundstream, Inc. Uniform speed control for a multi-channel digital recorder. 4,446,494, Cl. 360-73.000.
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Saunders, William T., 4,445,621, Cl. 220-273.000.
Stoltman, Donald D.; Kabasin, Daniel F.; and Field, Martin J., to General Motors Corporation. Hot film sensor for air flow meter. 4,445,369, Cl. 73-204.000.
Stolyar, Eduard A.: *See*—
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Strack, Karl-Ludwig: *See*—
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Strauss, Jurgen: *See*—
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Strehler, Hugo; Valentin, Guenter; and Hoerauf, Werner, to BASF Aktiengesellschaft. Process and apparatus for the production of plastic strands. 4,446,089, Cl. 264-178.00F.
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Herzl, Peter J.; and Strohmeier, Warren O., 4,445,388, Cl. 73-861.240.
Strolle, Christopher H., to RCA Corporation. Linear interpolation between regularly spaced digital samples. 4,446,529, Cl. 364-723.000.
Stroud, Edward A., to Stroudex Industries Inc. Vehicle structure. 4,445,701, Cl. 280-217.000.
Stroudex Industries Inc.: *See*—
Stroud, Edward A., 4,445,701, Cl. 280-217.000.
Structural Fibers, Inc.: *See*—
Bliley, Ward L., 4,446,092, Cl. 264-258.000.
Struve, Friedrich, to Gundle Holdings (Proprietary) Limited. Welding of plastics material. 4,445,955, Cl. 156-153.000.
Stubbs, Kenneth W., to Kenrod Enterprises. Solids collecting apparatus for a vacuum drain system. 4,446,016, Cl. 210-86.000.
Sturtzkopf, Robert. Method and device for determining the relative position of the upper jaw and lower jaw for the production of dentures. 4,445,856, Cl. 433-71.000.
Stutz Company: *See*—
Stutz, P. David; and Kuchta, George J., 4,445,993, Cl. 204-213.000.
Stutz, P. David; and Kuchta, George J., to Stutz Company. Laser perforated plating barrel and method of constructing the same. 4,445,993, Cl. 204-213.000.
Sugimoto, Makoto: *See*—
Sakai, Masao; Hashizume, Miyakazu; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,446,058, Cl. 252-507.000.
Sugiyama, Masatoshi; Yoshida, Kazutaka; and Ogawa, Akira, to Fuji Photo Film Co., Ltd. Ink-jet color printing system. 4,446,470, Cl. 346-140.00R.
Sugiyama, Masatoshi: *See*—
Maekawa, Masakazu; Nakamura, Sukenori; Sugiyama, Masatoshi; and Odawara, Hideo, 4,446,174, Cl. 427-261.000.
Sugiyama, Takekatsu: *See*—
Iwakura, Ken; and Sugiyama, Takekatsu, 4,446,209, Cl. 428-411.000.
Suhayda, Louis. Engine heater. 4,445,469, Cl. 123-142.50R.
Suling, Carlhans: *See*—
Konig, Joachim; Schnalke, Karl-Erwin; Suling, Carlhans; and Horacek: Gotz, 4,446,291, Cl. 526-209.000.
Sullivan, Leroy J.; and Waterfield, Robert L., to Chartered Industries Of Singapore Private Limited. Drum magazine for a gun. 4,445,418, Cl. 89-33.00D.
Sullivan, William C.; and Nimberger, Spencer M., to Rockwell International Corporation. Differential speed limiting device. 4,445,400, Cl. 74-711.000.
Sulzer Brothers Limited: *See*—
Hintsch, Otto, 4,445,546, Cl. 139-435.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Air flow rate meter apparatus. 4,445,368, Cl. 73-118.100.
Sunberg, Richard J.; and Benedict, James J., to Procter & Gamble Company, The. Aqueous gel containing tricalcium di(1-hydroxy-3-aminopropane-1,1-diphosphonate acid. 4,446,052, Cl. 252-315.100.
Sunds Defibrator AB: *See*—
Bystedt, Hjalmar S. I., 4,445,973, Cl. 162-261.000.
Sundstrand Corporation: *See*—
Lang, David J.; and Readman, John, 4,445,420, Cl. 91-3.000.
Sung, Rodney L., to Texaco Inc. Alcohol composition stabilized against corrosion by the use of an amino tetrazole. 4,445,907, Cl. 44-53.000.
Sunstore Kommanditbolag: *See*—
Platell, Ove B., 4,445,499, Cl. 126-430.000.
Superfos Glasuld A/S (Superfos A/S): *See*—
Rasmussen, Lauritz B. L., 4,446,186, Cl. 428-74.000.
Suyama, Tadakazu: *See*—
Naito, Ryoichi; Suyama, Tadakazu; and Iga, Yoshiro, 4,446,134, Cl. 424-101.000.
Suzue, Masayoshi: *See*—
Shibuta, Osamu; Suzue, Masayoshi; and Hasegawa, Tetuo, 4,446,295, Cl. 528-168.000.
Suzuki, Go; and Michishita, Kazuo, to NGK Insulators, Ltd. Method of manufacturing a ceramic structural body. 4,445,274, Cl. 29-832.000.
Suzuki, Saka.ru: *See*—
Noyori, Ryoji; Suzuki, Sakaru; and Okayama, Minoru, 4,446,312, Cl. 536-1.100.
Suzuki, Tsutomu, to Pioneer Electronic Corporation. Video format signal recording/reproducing system. 4,446,488, Cl. 358-342.000.
Suzuki, Yasuhiko: *See*—
Sakai, Masao; Hashizume, Miyakazu; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,446,058, Cl. 252-507.000.
Suzuki, Yasunori, to Yasui Sangyo Co., Ltd. Log splitter. 4,445,554, Cl. 144-193.00A.
Sviniin, Mikhail P.: *See*—
Ivanov, Andrei S.; Komorin, Leonid V.; Nikishkin, Vladimir I.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,446,374, Cl. 250-492.300.
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P. Safety restraint system and inertial reel therefor. 4,445,502, Cl. 128-25.00R.
Sweeney, George G.: *See*—
Castle, Peter M.; Sweeney, George G.; and Yannopoulos, Lymperios N., 4,446,169, Cl. 427-53.100.
Sweet, Richard C.: *See*—
Boser, Otmar H.; and Sweet, Richard C., 4,446,502, Cl. 361-308.000.
Swessel, John A., Jr.: *See*—
Link, Donald A.; and Swessel, John A., Jr., 4,446,503, Cl. 361-346.000.

Swindells, Roy J.: *See*—
Critchley, Richard J.; and Swindells, Roy J., 4,446,063, Cl. 252-633.000.
Swiss Aluminium Ltd.: *See*—
Bouille, Bernard, 4,445,849, Cl. 432-128.000.
Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,445,930, Cl. 71-105.000.
Sybron Corporation: *See*—
Peart, Edward L.; and Howard, Charlie J., 4,445,789, Cl. 374-198.000.
Sydorko, Peter J.: *See*—
Bohrn, Walter J.; and Sydorko, Peter J., 4,445,243, Cl. 8-151.000.
Sykes, Richard B.: *See*—
Gregson, Michael; and Sykes, Richard B., 4,446,317, Cl. 544-22.000.
Synapco Ltd.: *See*—
Meyers, Stuart R., 4,445,283, Cl. 36-29.000.
Syndrill Carbide Diamond Company: *See*—
Sahley, Lloyd W., 4,445,580, Cl. 175-404.000.
Syngas Company: *See*—
Casper, James R.; and Hauer, Harvey J., 4,445,463, Cl. 122-7.00R.
Syska, Andrew J., to Thermal Systems Engineering, Inc. Recuperative burner with exhaust gas recirculation means. 4,445,842, Cl. 431-115.000.
Syva Company: *See*—
Lin, Cheng-I; and Singh, Prithipal, 4,446,065, Cl. 260-112.00R.
Szantay, Csaba; Szbao, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, to Richter Gedeon Vegyeszeti Gyar R.T. Hexahydroindoloquinolizinium and octahydroindoloquinolizine esters, and method of increasing blood flow in an animal with hydroxyamino-eburnane derivatives. 4,446,139, Cl. 424-256.000.
Szbao, Lajos: *See*—
Szantay, Csaba; Szbao, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; and Keve, Tibor, 4,446,139, Cl. 424-256.000.
Szpak, Anthony D.: *See*—
English, Philip H.; and Szpak, Anthony D., 4,446,158, Cl. 426-79.000.
T. F. Hudgins & Associates, Inc.: *See*—
Martin, Henry W., 4,445,454, Cl. 116-106.000.
Tabutin, Andre: *See*—
Champeau, Marcel; and Tabutin, Andre, 4,445,405, Cl. 82-2.500.
Taggents, Inc.: *See*—
Stieff, Lorin R.; and Dempsey, John C., 4,445,364, Cl. 73-40.700.
Tai, Ho T., to Lever Brothers Company. Built liquid detergent compositions. 4,446,043, Cl. 252-105.000.
Taira, Shigenobu, to Fujitsu Limited. MIS Device including a substrate bias generating circuit. 4,446,384, Cl. 307-297.000.
Takada, Masaaki: *See*—
Kosuda, Hironori; Takada, Masaaki; and Inoue, Hisashi, 4,445,875, Cl. 464-14.000.
Takahashi, Kenichi: *See*—
Ohsawa, Kazuya; Shibata, Toshiaki; and Takahashi, Kenichi, 4,445,755, Cl. 350-96.340.
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, to Nippon Steel Corporation. High strength cold rolled steel strip having an excellent deep drawability. 4,445,946, Cl. 148-36.000.
Takahashi, Yoshio: *See*—
Sasaki, Takeshi; Akiba, Kiyoshi; and Takahashi, Yoshio, 4,445,399, Cl. 74-603.000.
Takakuwa, Eiji; Nakano, Kazumi; and Kizitani, Izumi, to Nippondenso Co., Ltd. Ignition timing control apparatus with knock sensor. 4,445,479, Cl. 123-425.000.
Takamatsu, Hideo; and Minatono, Shobu, to Kuraray Co., Ltd. Modified cis-1,4-polyisoprene rubber, a process for manufacturing the same, and a composition containing the same. 4,446,281, Cl. 525-282.000.
Takano, Akihisa: *See*—
Fukuda, Kunio; Tazaki, Kichiya; Takano, Akihisa; and Kusumi, Yuji, 4,446,272, Cl. 524-465.000.
Takaoka, Michio; Ono, Motoyuki; Kaji, Isao; and Yagi, Shigeki, to Fujikura Cable Works, Limited, The. Power cable joint structure including a reinforcement insulator containing electrode spherical bodies. 4,446,331, Cl. 174-73.00R.
Takasu, Yoshio; and Ishikawa, Shozo, to Canon Kabushiki Kaisha; and Copyer Kabushiki Kaisha. Electrophotographic photosensitive member having a hydrazone containing layer. 4,446,217, Cl. 430-58.000.
Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; and Fukase, Hiroshi, 4,446,319, Cl. 544-92.000.
Naito, Kenzo; Shinbo, Haruo; and Tsukamura, Kazuo, 4,446,318, Cl. 544-26.000.
Takei, Toshihiro: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,445,821, Cl. 417-366.000.
Takeshita, Junki: *See*—
Nakao, Masami; Okimoto, Haruo; Yada, Yoshikuni; and Takeshita, Junki, 4,445,474, Cl. 123-336.000.
Takeuchi, Masato: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Takeuchi, Seizi: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Takeuchi, Yasuhito: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Sano, Shinichi; and Higashiizumi, Takao, 4,445,379, Cl. 73-631.000.
Takiguchi, Ryohei; and Nagashima, Masayoshi, to Dai Nippon Printing Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Heat-sensitive recording sheet, and a method and device for fixing a recorded information thereon. 4,446,467, Cl. 346-76.0PH.
Takimoto, Toshiyuki: *See*—
Aoki, Keiji; and Takimoto, Toshiyuki, 4,445,481, Cl. 123-440.000.
Taleff, Alexander; Brady, Robert M.; and Blaszczak, Thaddeus E., to Westinghouse Electric Corp. Apparatus for manufacturing helical cores. 4,445,353, Cl. 72-136.000.
Tamai, Yasuo: *See*—
Mizuno, Chiaki; Tamai, Yasuo; and Tsuji, Nobuo, 4,446,205, Cl. 428-327.000.
Tamaru, Shigemi: *See*—
Eguchi, Kiyoshi; Ishikawa, Takayoshi; Tamaru, Shigemi; Genba, Yasushi; and Kodera, Toshihiko, 4,446,347, Cl. 200-144.00R.
Tamura, Kohki: *See*—
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Tanaka, Atsuo, to Sharp Kabushiki Kaisha. Computer for calculating the similarity between patterns. 4,446,531, Cl. 364-728.000.
Tanaka, Hideki: *See*—
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, 4,445,489, Cl. 123-571.000.
Tanaka, Masaaki: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.
Tanaka, Masashi: *See*—
Ishikawa, Yuzuru; and Tanaka, Masashi, 4,445,777, Cl. 356-139.000.
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Exhaust gas recirculation control for diesel engine. 4,445,488, Cl. 123-569.000.
Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, to Hitachi, Ltd. Combustion control apparatus. 4,445,841, Cl. 431-27.000.
Tanca, Michael C., to Combustion Engineering, Inc. Slag tap gas flow inducement in wet-bottom furnaces. 4,445,441, Cl. 110-165.00R.
Tang, Denny D.: *See*—
Isaac, Randall D.; Ning, Tak H.; and Tang, Denny D., 4,446,476, Cl. 357-67.000.
Tange, Michiaki, to Marui Ltd. Head set arrangement for bicycle. 4,445,703, Cl. 280-279.000.
Tanouchi, Tadao; Shigeoka, Satoshi; Kawamura, Masanori; Hayashi, Masaki; Terashima, Hiroshi; and Hirata, Fumio, to Ono Pharmaceutical Co., Ltd. Rhodanine derivatives. 4,446,143, Cl. 424-270.000.
Tanski, James A. Roof and gutter saving device. 4,445,301, Cl. 52-11.000.
Tapco Products Company, Inc.: *See*—
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., 4,445,356, Cl. 72-319.000.
Tarcsay, Lajos: *See*—
Baschang, Gerhard; Dietrich, Felix M.; Gisler, Roland; Hartmann, Albert; Stanek, Jaroslav; and Tarcsay, Lajos, 4,446,128, Cl. 424-88.000.
Tarr, Fred P., to Polaroid Corporation. Peristaltic pump apparatus. 4,445,826, Cl. 417-476.000.
Tate, Thomas B.: *See*—
Seidl, Allen W., 4,445,250, Cl. 15-257.060.
Taylor, Leonard G., to Allied Steel and Wire Limited. Reinforcement supports. 4,445,308, Cl. 52-687.000.
Taylor, Noel R.; and Taylor, Paul A. Automatic load seeking control for a pumpjack motor. 4,446,415, Cl. 318-798.000.
Taylor, Paul A.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,446,415, Cl. 318-798.000.
Taylor, Thomas E.: *See*—
Stewart, Robert D.; and Taylor, Thomas E., 4,445,443, Cl. 110-245.000.
Tazaki, Kichiya: *See*—
Fukuda, Kunio; Tazaki, Kichiya; Takano, Akihisa; and Kusumi, Yuji, 4,446,272, Cl. 524-465.000.
Technicare Corporation: *See*—
Hadjicostis, Andreas, 4,446,395, Cl. 310-327.000.
Kaminski, Perry, 4,445,380, Cl. 73-642.000.
Technion Research and Development Foundation Ltd.: *See*—
Merhav, Shmuel J., 4,445,376, Cl. 73-510.000.
Teepak, Inc.: *See*—
Smith, Burl L.; and Kearby, Ronald S., 4,446,167, Cl. 426-650.000.
Teige, Wolfgang: *See*—
Hahnke, Manfred; and Teige, Wolfgang, 4,445,904, Cl. 8-538.000.
Teijin Limited: *See*—
Minemura, Norihiro; and Kobayashi, Shigenobu, 4,445,903, Cl. 8-492.000.
Okumura, Nobuya; Ichihashi, Tetsuo; Matsumura, Shunichi; and Inata, Hiroo, 4,446,262, Cl. 524-89.000.
Telectronics Pty. Ltd.: *See*—
Cowdery, David; and Cooper, John R., 4,445,511, Cl. 128-419.00P.

Temple University of the Commonwealth System of Higher Education: *See—*
Zubrzycki, Leonard J., 4,446,230, Cl. 435-6.000.
Templin, Philip R., to Gulf Research & Development Company. Continuous extrusion of paraffin wax. 4,446,087, Cl. 264-148.000.
Terashima, Hiroshi: *See—*
Tanouchi, Tadao; Shigeoka, Satoshi; Kawamura, Masanori; Hayashi, Masaki; Terashima, Hiroshi; and Hirata, Fumio, 4,446,143, Cl. 424-270.000.
Terashima, Minoru: *See—*
Sato, Kiyoshi; Terashima, Minoru; Sorimachi, Haruo; Naka, Toshiaki; Kanno, Takeo; and Yamada, Fumiaki, 4,446,355, Cl. 219-216.000.
Tereshin, Igor M.: *See—*
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., 4,446,316, Cl. 536-112.000.
Terui, Nobuo, to Olympus Optical Co., Ltd. Variable frequency-response equalizer. 4,446,493, Cl. 360-65.000.
Tetra Pak Developpement S.A.: *See—*
Reil, Wilhelm, 4,445,309, Cl. 53-410.000.
Texaco Inc.: *See—*
Espedal, Michael L., 4,445,444, Cl. 110-261.000.
Lee, Kung-You; McMahon, Matthew A.; and Powell, Justin C., 4,446,057, Cl. 502-355.000.
Petty, Randall H.; and Bartley, Burton H., 4,446,010, Cl. 208-120.000.
Schlicht, Raymond C.; and Skrobul, Anthony P., 4,446,038, Cl. 252-51.50A.
Skrobul, Anthony P.; and Kaufman, Benjamin J., 4,446,053, Cl. 252-33.600.
Sung, Rodney L., 4,445,907, Cl. 44-53.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; McGuirk, Andrew C.; and LaPlante, William J., 4,446,450, Cl. 337-380.000.
Boulanger, Henry J., 4,446,451, Cl. 337-380.000.
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,446,514, Cl. 364-200.000.
Grenier, Aime J.; and Hirsbrunner, Hans G., 4,446,500, Cl. 361-103.000.
Peterson, Robert W.; Grenier, Aime J.; and Hirsbrunner, Hans G., 4,446,501, Cl. 361-114.000.
Tezuka, Masao: *See—*
Endo, Hiroshi; Hirate, Naoyuki; and Tezuka, Masao, 4,446,115, Cl. 423-63.000.
Thaler, Warren A.: *See—*
Lundberg, Robert D.; and Thaler, Warren A., 4,446,267, Cl. 524-211.000.
Thatcher, Alan J. Spin trimmer for removing flashing from the tops of plastic bottles. 4,445,406, Cl. 82-46.000.
Theilen, Kurt A., to Lukas-Erzett Vereinigte Schleif und Fraswerkzeugfabrikes. Method of making a cutting member and article produced thereby. 4,445,810, Cl. 407-118.000.
Thermal Specialties Inc.: *See—*
McCaleb, George E., 4,445,573, Cl. 166-250.000.
Thermal Systems Engineering, Inc.: *See—*
Syska, Andrew J., 4,445,842, Cl. 431-115.000.
Thermalloy Incorporated: *See—*
Jordan, William D.; Hinshaw, Howard G.; and Clemens, Donald L., 4,446,504, Cl. 361-386.000.
Thermo Electron Corporation: *See—*
Cole, William E.; O'Connell, Drew P.; and Griffith, James L., 4,445,919, Cl. 65-27.000.
Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping tool unit. 4,445,438, Cl. 104-12.000.
Thiebault, Andre: *See—*
Badoz, Janine; Bardin, Michelle; Bernard, Claude; Herlem, Michel; Robert, Guy; and Thiebault, Andre, 4,446,215, Cl. 429-190.000.
Thies, Jerome A.; and Tietje, Mark E., to Caterpillar Tractor Co. Hydraulic hose assembly and method. 4,445,332, Cl. 60-455.000.
Thilmony, Evelyn: *See—*
Browning, Andrea, 4,445,950, Cl. 156-63.000.
Thiokol Corporation: *See—*
Shaw, Graham C., III; and Reed, Russell, Jr., 4,445,947, Cl. 149-19.300.
Tholl, Steven G.; and Vonkohlar, John C., IV, to Transtart, Inc. Remote starting of an internal combustion engine. 4,446,460, Cl. 340-825.690.
Thoma, Wilhelm: *See—*
Konig, Eberhard; Thoma, Wilhelm; Pedain, Josef; and Konig, Klaus, 4,446,293, Cl. 528-45.000.
Thoman, Daniel L.: *See—*
Faulkner, Richard D.; Thoman, Daniel L.; and McDonie, Arthur F., 4,446,401, Cl. 313-533.000.
Thomas, Charles E. Flashlight with compass means integral thereto. 4,446,509, Cl. 362-184.000.
Thomas, David C., to Corban International, Ltd. Method and apparatus for providing security for computer software. 4,446,519, Cl. 364-300.000.
Thomas, Harold T.: *See—*
Wadsworth, Donald H.; Thomas, Harold T.; Fletcher, George L.; and Weidner, Charles H., 4,446,223, Cl. 430-338.000.
Thomas, Ian M., to Owens-Illinois, Inc. Process of making glass articles having antireflective coating. 4,446,171, Cl. 427-160.000.
Thomas Jefferson University: *See—*
Osterholm, Jewell L., 4,445,500, Cl. 128-1.00R.
Osterholm, Jewell L., 4,445,514, Cl. 128-632.000.
Osterholm, Jewell L., 4,445,886, Cl. 604-28.000.
Osterholm, Jewell L., 4,445,887, Cl. 604-28.000.
Osterholm, Jewell L., 4,445,888, Cl. 604-28.000.
Osterholm, Jewell L., 4,446,154, Cl. 424-350.000.
Osterholm, Jewell L., 4,446,155, Cl. 424-350.000.
Thompson, Clifford F.: *See—*
Hansen, Bent J.; and Thompson, Clifford F., 4,445,677, Cl. 269-41.000.
Thompson, David J., to Imperial Chemical Industries PLC. Pleochroic anthraquinone dyes. 4,446,047, Cl. 252-299.100.
Thompson, Gary J.; and Carey, C. H., to Morgan Construction Company. Fluidized bed lubricant container. 4,445,351, Cl. 72-43.000.
Thompson, Neil E. S., to Petrolite Corporation. Preparation of mixture of nitrogen and sulfur-nitrogen heterocyclics and use in corrosion inhibiting. 4,446,056, Cl. 252-391.000.
Thompson, William P.: *See—*
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,445,502, Cl. 128-25.00R.
Thorn Emi Limited: *See—*
Ranby, Peter W.; and Palowkar, David R., 4,446,048, Cl. 252-301.40S.
Thorsby, Grover A.; and Burgess, Mark E. Irrigation system. 4,445,643, Cl. 239-197.000.
Three Bond Co., Ltd.: *See—*
McGinniss, Vincent D., 4,446,246, Cl. 502-155.000.
Thule United Limited a British Company: *See—*
Harry, Alan, 4,446,022, Cl. 210-388.000.
Tidd, James A.; and Tidd, Miles H., to Alphatype Corporation. Ultra-high resolution photocomposition system employing electronic character generation from magnetically stored data. 4,446,491, Cl. 360-48.000.
Tidd, Miles H.: *See—*
Tidd, James A.; and Tidd, Miles H., 4,446,491, Cl. 360-48.000.
Tietje, Mark E.: *See—*
Thies, Jerome A.; and Tietje, Mark E., 4,445,332, Cl. 60-455.000.
Tillander, Hans: *See—*
Ekbladh, Fred V. G.; and Tillander, Hans, 4,445,897, Cl. 604-280.000.
Tilly, Lynn K.; and Sawa, John J., to AMSTED Industries Incorporated. Railroad vehicle truck with single wheelset. 4,445,439, Cl. 105-165.000.
Tioxide Group Limited: *See—*
List, David E., 4,446,031, Cl. 252-1.000.
Tippetts, Thomas B., to Garrett Corporation, The. Pressure-to-electric output system for an angular rate sensor or the like. 4,445,377, Cl. 73-516.0LM.
Tipton, Lynn L.: *See—*
Fox, David A.; and Tipton, Lynn L., 4,446,417, Cl. 322-25.000.
Tison, Richard P., to General Motors Corporation. Parasitic electrodialysis recovery of dissolved chemicals from dilute solutions directly into a plating bath. 4,445,984, Cl. 204-49.000.
Tobita, Hiroshi: *See—*
Okada, Hideo; Imahashi, Jinichi; Takeuchi, Seizi; Okabe, Sigeru; Kahara, Toshiki; Ishii, Kenzo; Takeuchi, Masato; Matsuda, Shimpei; Tamura, Kohki; and Tobita, Hiroshi, 4,446,210, Cl. 429-42.000.
Todd, Bradley L.: *See—*
Byrd, Audis C.; Todd, Bradley L.; and Pattison, William W., Jr., 4,445,465, Cl. 122-392.000.
Todokoro, Shigeru: *See—*
Kojima, Tadashi; and Todokoro, Shigeru, 4,446,489, Cl. 360-13.000.
Tokarzewski, Richard J.: *See—*
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Tokuda, Hiroshi: *See—*
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Tokyo Juki Industrial Co., Ltd.: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Arinobu, Mutsuhiro, 4,446,081, Cl. 261-64.00R.
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Iida, Tetsuya; and Sakaue, Tatsuo, 4,446,567, Cl. 377-79.000.
Inouye, Tamon, 4,446,521, Cl. 364-414.000.
Kameyama, Shuichi, 4,445,967, Cl. 156-648.000.
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Takiguchi, Ryohei; and Nagashima, Masayoshi, 4,446,467, Cl. 346-76.0PH.
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Tolle, Laura L.: *See—*
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Tomalesky, Allan W.: *See*—
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Tomy Corporation: *See*—
Nuttal, Michael; and Yamamoto, Shoji, 4,445,868, Cl. 434-88.000.

Tongel, Richard R., to PPG Industries, Inc. Registration blocks for a photomask assembly. 4,445,775, Cl. 355-122.000.

Toray Industries, Inc.: *See*—
Moriki, Yoshikazu; and Ogasawara, Masafumi, 4,445,833, Cl. 425-131.500.

Torchilin, Vladimir P.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh L., 4,446,316, Cl. 536-112.000.

Torisawa, Akira: *See*—
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Tosco Corporation: *See*—
LaDelfa, Christopher; and Nutter, John F., 4,445,976, Cl. 201-41.000.

Toska Co., Ltd.: *See*—
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Totten, Adrian M.: *See*—
Arena, Alan J.; Pounder, Edwin; Pawlowski, Michael; and Totten, Adrian M., 4,445,781, Cl. 366-154.000.

Touchette, Norman W.: *See*—
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlind, William, 4,446,061, Cl. 252-602.000.

Toudo, Kenzi: *See*—
Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, 4,445,841, Cl. 431-27.000.

Town, Michael H.: *See*—
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Toyo Kogyo Co., Ltd.: *See*—
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Nakao, Masami; Okimoto, Haruo; Yada, Yoshikuni; and Takeshita, Junki, 4,445,474, Cl. 123-336.000.

Toyo Kohan Co., Ltd.: *See*—
Kanda, Katsumi; Kunimoto, Katsunobu; Yamane, Keiji; and Kondo, Yoshikazu, 4,445,998, Cl. 264-385.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Aoki, Keiji; and Takimoto, Toshiyuki, 4,445,481, Cl. 123-440.000.

Transtart, Inc.: *See*—
Tholl, Steven G.; and Vonkohlar, John C., IV, 4,446,460, Cl. 340-825.690.

Tratz, Herbert; Finckh, Hermann; and Kunstle, Konrad, to Kraftwerk Union Aktiengesellschaft. Installation for generating superheated process steam from salt-containing raw water. 4,445,325, Cl. 60-39.182.

Treder, Ralph A., Jr., to Western Electric Co., Inc. Method for ultrasonically determining characteristics of a body. 4,445,360, Cl. 73-1.0DV.

Tree Farmers International, Inc.: *See*—
Peters, Thomas, III, 4,445,557, Cl. 144-336.000.

Trelleborg AB: *See*—
Dehlen, Bengt L. A., 4,446,192, Cl. 428-339.000.

Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,446,125, Cl. 424-49.000.

Tri-Motion Industries, Inc.: *See*—
Bilski, Gerard W., 4,445,538, Cl. 137-596.200.

Trippett, Richard J., to General Motors Corporation. Variable preload foil bearing. 4,445,792, Cl. 384-103.000.

Troxler, A. Ray. Control assembly for bicycles. 4,445,704, Cl. 280-292.000.

Trudeau, Luc. Dismantable joint arrangement. 4,445,801, Cl. 403-219.000.

Trumbetas, Jerome F.: *See*—
Malizia, Peter D.; and Trumbetas, Jerome F., 4,446,162, Cl. 426-424.000.

Truninger, Thomas, to Adna AG. Guidable bogie truck for mobile cranes. 4,445,588, Cl. 180-233.000.

Truth Incorporated: *See*—
Sandberg, Christopher T., 4,445,794, Cl. 384-428.000.

TRW Inc.: *See*—
Grois, Igor; Margolin, Mark; and Berg, Alan, 4,445,750, Cl. 350-96.210.
Reynolds, Frederick W., III; Miranda, Robert E.; and Fabian, Roger C., 4,445,952, Cl. 156-94.000.
Reynolds, Frederick W., III; Miranda, Robert E.; and Fabian, Roger C., 4,445,952, Cl. 156-94.000.

Tsao, Yuh-hwang: *See*—
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Tseng, Chih-Shan. Padlock. 4,445,347, Cl. 70-38.00B.

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Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., 4,445,564, Cl. 164-186.000.

Tsuboka, Eiichi, to Matsushita Electric Industrial Co., Ltd. Fast hadamard transform device. 4,446,530, Cl. 364-725.000.

Tsuchiya, Yoshikazu: *See*—
Sato, Makoto; Ohmori, Taiji; and Tsuchiya, Yoshikazu, 4,446,522, Cl. 364-426.000.

Tsuji, Nobuo: *See*—
Mizuno, Chiaki; Tamai, Yasuo; and Tsuji, Nobuo, 4,446,205, Cl. 428-327.000.

Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, to Chugai Seiyaku Kabushiki Kaisha. Light scattering immunoassay involving particles with selective frequency band apparatus. 4,446,239, Cl. 436-532.000.

Tsukamura, Kazuo: *See*—
Naito, Kenzo; Shinbo, Haruo; and Tsukamura, Kazuo, 4,446,318, Cl. 544-26.000.

Tsushima, Noboru; Fuse, Masashi; Sasaki, Toshio; Ogata, Masayuki; Mimori, Teruo; and Mukai, Tadashi, to Alps Electric Co., Ltd. Magnetic course detector. 4,445,279, Cl. 33-356.000.

Tsuzurabara, Mamoru, to Hitachi, Ltd. Method of producing magnetrons. 4,445,873, Cl. 445-6.000.

Tuenkers Maschinenbau G.m.b.H.: *See*—
Tunkers, Josef-Gerhard, 4,445,676, Cl. 269-32.000.

Tuftco Corporation: *See*—
Beasley, Max M., 4,445,446, Cl. 112-79.00R.

Tunkers, Josef-Gerhard, to Tuenkers Maschinenbau G.m.b.H. Fluid-operated bell crank clamping device with elastic spring link and releasable clamping arm. 4,445,676, Cl. 269-32.000.

Tupper, Leland C., to General Electric Company. Terminal voltage limit regulator for a load commutated inverter. 4,446,414, Cl. 318-723.000.

Turiot, Andre , to Messier-Hispano-Bugatti (S.A.). Shock absorber-actuator. 4,445,672, Cl. 267-64.160.

Turnbull, David: *See*—
Pairaudeau, Reginald D.; and Turnbull, David, 4,446,091, Cl. 264-225.000.

Tweedy, Ernest P., to GTE Laboratories Incorporated. Wideband switch crosspoint and switching matrix. 4,446,552, Cl. 370-58.000.

Twersky, Marvin; Splinter, William E.; and Sandhorst, Bruce C., to University of Nebraska, The Board of Regents of the. Soil probe and method of obtaining moisture, temperature and root distribution of a soil profile. 4,445,788, Cl. 374-142.000.

Tyndall, Wayne: *See*—
Hyde, Bruce; Tyndall, Wayne; Abernethy, Dennis; and Mellgren, Per G., 4,445,552, Cl. 144-3.00D.

Tyszkiewicz, Theodore J.: *See*—
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Tzakis, George J.: *See*—
Johnson, Fred D.; Flasza, Michael D.; and Tzakis, George J., 4,446,443, Cl. 330-257.000.

U.C. Industries: *See*—
Cisar, James R.; and Grauzer, Attila, 4,445,837, Cl. 425-141.000.

Uchida, Hiroyasu, to Fuji Xerox Co., Ltd. Original circulating and conveying device for copying machine. 4,445,682, Cl. 271-301.000.

Ueba, Hisaaki: *See*—
Nakamura, Masaaki; and Ueba, Hisaaki, 4,445,964, Cl. 156-500.000.

Ueda, Makoto: *See*—
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Ueno, Hideyuki, to Ben Clements & Sons, Inc.; Toska Co., Ltd.; and Japan Bano'k Co., Ltd. Tag attacher. 4,445,882, Cl. 493-376.000.

Uhlig, Jurgen: *See*—
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Ujiie, Seiichi: *See*—
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Ulm, John G.: *See*—
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Ulrich, Bernhard; and Slot, Gys H., to Ulrich, Max Bernhard. Device for straightening spinal column. 4,445,513, Cl. 128-69.000.

Ulrich, Max Bernhard: *See*—
Ulrich, Bernhard; and Slot, Gys H., 4,445,513, Cl. 128-69.000.

Umeya, Eiji: *See*—
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Union Carbide Corporation: *See*—
Bartley, William J.; and Wilson, Thomas P., 4,446,251, Cl. 518-716.000.
Brown, Harry J., 4,446,196, Cl. 428-544.000.
Jamerson, Jackie D.; Billig, Ernst; and Bryant, David R., 4,446,074, Cl. 260-429.00R.
Keogh, Michael J., 4,446,279, Cl. 525-106.000.
Pairaudeau, Reginald D.; and Turnbull, David, 4,446,091, Cl. 264-225.000.

Union Oil Company of California: *See*—
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Hsieh, Wen-Ching; Bostich, June M.; and Koepke, Jeffery W., 4,446,036, Cl. 252-8.55D.

Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., 4,446,248, Cl. 502-211.000.
Young, Donald C., 4,445,925, Cl. 71-28.000.
Union Siderurgique du Nord et de l'Est de la France: *See*—
Viannay, Stephane; Germain, Alfred; and Sebbah, Jack, 4,445,525, Cl. 134-122.00R.
Union Special Corporation: *See*—
Fletcher, Roy W., 4,445,448, Cl. 112-110.000.
Unisearch Limited: *See*—
Goldsmid, Hiroshi J., 4,445,367, Cl. 73-81.000.
United States Filter Fluid Systems Corp.: *See*—
O'Cheskey, Theodore H.; and Edwards, Hugh T., Jr., 4,446,352, Cl. 219-121.0LC.
United States of America
Agriculture: *See*—
Yeadon, David A., 4,445,902, Cl. 8-474.000.
Yeadon, David A., 4,445,902, Cl. 8-474.000.
Army: *See*—
Kearney, Frank W., 4,446,354, Cl. 219-130.010.
Kumar, Ashok; Segan, Ellen G.; Bukowski, John M.; and Helgeland, Jon L., 4,445,989, Cl. 204-147.000.
Pollard, John H., 4,445,269, Cl. 29-572.000.
Stern, Richard A., 4,446,448, Cl. 333-1.100.
Commerce: *See*—
Potzick, James E.; and Robertson, Baldwin, 4,445,389, Cl. 73-861.270.
Energy: *See*—
Compere, Alicia L.; Googin, John M.; and Griffith, William L., 4,445,908, Cl. 44-56.000.
Dinsmore, Stanley R.; and Mrochek, John E., 4,446,105, Cl. 422-70.000.
Holt, Joseph B., 4,446,242, Cl. 501-96.000.
Kaus, Thomas D., 4,446,212, Cl. 429-103.000.
Posey, Franz A.; and Palko, Aloysius A., 4,445,935, Cl. 75-118.00P.
Reimann, Robert C., 4,445,340, Cl. 62-101.000.
Schmidt, Frederick A.; Rehbein, David; and Chiotti, Premo, 4,446,120, Cl. 423-350.000.
Steeves, Arthur F.; and Bibb, Albert E., 4,445,988, Cl. 204-129.200.
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Russo, Raimondo; and Liotta, Lance A., 4,446,234, Cl. 435-29.000.
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Worthington, Robert B., 4,445,931, Cl. 75-0.50B.
National Aeronautics and Space Administration: *See*—
Claus, Richard O.; and Zerwekh, Paul S., 4,446,396, Cl. 310-334.000.
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,446,199, Cl. 428-639.000.
Koepf, Gerhard A., 4,446,556, Cl. 372-4.000.
Zuckerwar, Allan J., 4,445,378, Cl. 73-589.000.
National Aeronautics & Space Administration: *See*—
Bond, Hollis H., Jr.; and Franklin, Carl R., 4,446,459, Cl. 340-825.210.
Navy: *See*—
Breglia, Denis R.; and Oharek, Frank J., 4,446,480, Cl. 358-104.000.
Burns, William K., 4,445,780, Cl. 356-350.000.
Connolly, George C., Jr., 4,446,544, Cl. 367-155.000.
Irzinski, Edward P., 4,446,463, Cl. 343-371.000.
Lakin, Charles T.; and Willett, Norman F., 4,446,363, Cl. 250-203.00R.
Markowski, Stanley J.; and Reilly, Richard S., 4,445,338, Cl. 60-748.000.
McLandrich, Matthew N.; and Albares, Donald J., 4,446,543, Cl. 367-149.000.
Miller, Donald; and Bowers, Clark A., 4,445,719, Cl. 294-88.000.
Mitsch, Ronald A., 4,446,068, Cl. 260-239.00E.
Moffett, Mark B.; and Konrad, William L., 4,445,361, Cl. 73-1.0DV.
Smith, Rex L., 4,445,920, Cl. 65-59.210.
Stanton, Horace D.; and Reed, Russell, Jr., 4,445,948, Cl. 149-19.910.
U.S. Philips Corporation: *See*—
Boser, Otmar H.; and Sweet, Richard C., 4,446,502, Cl. 361-308.000.
Bouwhuis, Gijsbertus; and Braat, Josephus J. M., 4,446,548, Cl. 369-109.000.
Duijkers, Peter A., 4,446,483, Cl. 358-154.000.
Faber, Johannes W.; and Weick, Gunter, 4,445,752, Cl. 350-96.200.
Lippits, Gerardus J. M.; Kloosterboer, Johan G.; and Melis, Godefridus, 4,446,549, Cl. 369-275.000.
van de Plassche, Rudy J.; Dijkmans, Eise C.; and Schouwenaars, Hendrikus J., 4,446,419, Cl. 323-316.000.
Van Dijk, Ate, 4,446,545, Cl. 369-44.000.
United Technologies Corporation: *See*—
Fortmann, William E., 4,445,815, Cl. 415-12.000.
Schratt, John F.; and Weber, Joseph J., 4,445,790, Cl. 374-45.000.
Selleck, Franklin G., 4,446,461, Cl. 340-870.320.
Warner, John L., 4,445,342, Cl. 62-172.000.
Unitika, Ltd.: *See*—
Kifune, Koji, 4,445,885, Cl. 604-28.000.
University of Minnesota, Regents of the: *See*—
Hall, Henry J.; and Haygreen, John G., 4,445,387, Cl. 73-845.000.
University of Nebraska, The Board of Regents of the: *See*—
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University of Rochester, The: *See*—
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University of Texas System: *See*—
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,446,365, Cl. 250-213.00R.
University of Virginia Alumni Patents Foundation, The: *See*—
Larner, Joseph; Cheng, Kang; and Galasko, Gail, 4,446,064, Cl. 260-112.00R.
UOP Inc.: *See*—
Qualeatti, Gail M.; and Germanas, Dalia, 4,446,073, Cl. 260-409.000.
Upjohn Company, The: *See*—
Jacobine, Anthony F., 4,446,247, Cl. 502-167.000.
Uranerzbergbau-GmbH: *See*—
Krismer, Bruno; and Hoppe, Axel, 4,446,116, Cl. 423-63.000.
Urata, Shinji: *See*—
Enomoto, Shigeo; Hirobe, Hitoshi; and Urata, Shinji, 4,445,757, Cl. 350-429.000.
USS Engineers and Consultants, Inc.: *See*—
Cappelli, Romano, 4,445,262, Cl. 29-402.080.
Uzuka, Mitsuo, to Sony Corporation. Brushless DC motor driving circuit. 4,446,406, Cl. 318-254.000.
Vaerewyck, Eugene G.: *See*—
Divens, William C.; and Vaerewyck, Eugene G., 4,445,751, Cl. 350-96.140.
Valdmanis, Janis A.; and Mourou, Gerard, to University of Rochester, The. Measurement of electrical signals with picosecond resolution. 4,446,425, Cl. 324-77.00K.
Valentin, Guenter: *See*—
Strehler, Hugo; Valentin, Guenter; and Hoerauf, Werner, 4,446,089, Cl. 264-178.00F.
Valette, Serge, to Commissariat a l'Energie Atomique. Integrated Fresnel lens and its production process. 4,445,759, Cl. 350-96.120.
van Asperen, Pieter J.: *See*—
Gaymans, Reinoud J.; and van Asperen, Pieter J., 4,446,304, Cl. 528-335.000.
Van Bever, Willem F. M., to Janssen Pharmaceutica N.V. Antimicrobial compositions for the topical treatment of acne vulgaris. 4,446,145, Cl. 424-273.00R.
Van Brussel, Hendrik M.; and Simons, Joseph A. G., to Leuven Research and Development V.Z.W. Displacement control device. 4,445,273, Cl. 29-714.000.
van den Broek, Bernardus C., to Stork Services B.V. Dock device. 4,445,451, Cl. 114-222.000.
van de Plassche, Rudy J.; Dijkmans, Eise C.; and Schouwenaars, Hendrikus J., to U.S. Philips Corporation. Current stabilizing arrangement. 4,446,419, Cl. 323-316.000.
Vanderlind, William: *See*—
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Van Dijk, Ate, to U.S. Philips Corporation. Apparatus for reading a disk-shaped record carrier. 4,446,545, Cl. 369-44.000.
Van Dorsselaer, Viviane: *See*—
Gerhart, Fritz; and Van Dorsselaer, Viviane, 4,446,151, Cl. 424-319.000.
Van Laningham, Kalvin G., to Warner Electric Brake & Clutch Company. Armature assembly for electromagnetic coupling. 4,445,606, Cl. 192-106.100.
Vann, Roy R., to GEO Vann, Inc. Continuous borehole formed horizontally through a hydrocarbon producing formation. 4,445,574, Cl. 166-268.000.
Van Nordstrand, Robert A., to Chevron Research Company. Hydrocarbons hydroprocessing with imogolite catalyst. 4,446,244, Cl. 502-84.000.
Van Siclen, Howard E., Jr., to Bendix Corporation, The. Ignition system for an internal combustion engine. 4,445,490, Cl. 123-602.000.
Varloud, Christian: *See*—
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Varma, Ravi K., to E. R. Squibb & Sons, Inc. Intermediates useful in the preparation of 17,17-bis(substituted thio) androstenes. 4,446,071, Cl. 260-397.300.
Vasilakis, Andrew D.: *See*—
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Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Coating composition of a blend of a glycidyl acrylic polymer and a reactive polysiloxane. 4,446,259, Cl. 523-408.000.
Vaughan, David S.: *See*—
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Veb Werkzeugmaschinenkombinat "7 Oktober" Berlin: *See*—
Ebermann, Joachim; Graf, Heinz; Schleicher, Siegfried; and Uhlig, Jurgen, 4,446,408, Cl. 318-600.000.
Verbatim Corporation: *See*—
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Verhaeghe, Michel: *See*—
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Vernay, Louis: *See—*
Chambon, Jean P.; Dufay, Jean-Francois; Grand Chavin, Paul; Perrin, Georges J.; and Vernay, Louis, 4,445,785, Cl. 368-187.000.

Verwaerde, Francoise; Gosset, Serge; and Huchette, Michel, to Roquette Freres. Hydrogenated starch hydrolysate. 4,445,938, Cl. 127-29.000.

Viannay, Stephane; Germain, Alfred; and Sebbah, Jack, to Union Siderurgique du Nord et de l'Est de la France. Arrangement of the input and output ends of a cooling machine for metal sheets. 4,445,525, Cl. 134-122.00R.

Victor Company of Japan, Limited: *See—*
Hirayama, Hiromichi, 4,446,497, Cl. 360-109.000.
Sato, Yoshihiro, 4,445,634, Cl. 229-40.000.

Vock, Manfred H.: *See—*
Boden, Richard M; Vock, Manfred H.; and Tyszkiewicz, Theodore J., 4,446,157, Cl. 426-3.000.
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,446,060, Cl. 252-522.00R.

Volk, Charles H.: *See—*
Kwon, Tae M.; and Volk, Charles H., 4,446,428, Cl. 324-304.000.

Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., to Mike Volk Co., Inc., The. Effluent air filtration apparatus. 4,445,912, Cl. 55-283.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Bloch, Willi, 4,445,648, Cl. 242-107.600.
Hofbauer, Peter; Heidemeyer, Paulus; and Scholz, Romanus, 4,445,601, Cl. 192-48.800.

von Bieren, Karlheinz, to Rockwell International Corporation. Laser with annular resonator. 4,446,559, Cl. 372-95.000.

von Bose, Robert J., to Bell Petroleum Services, Inc. Sonic logging tool. 4,446,539, Cl. 367-25.000.

von Daehne, Welf, to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab). Derivatives of penicillanic acid. 4,446,144, Cl. 424-270.000.

Voneky, Geza; and Schussler, Hans H., to Daimler-Benz Aktiengesellschaft. Stepped end-gauge block apparatus. 4,445,276, Cl. 33-168.00R.

von Gentzkow, Wolfgang; and Rubner, Roland, to Siemens Aktiengesellschaft. N,N'-Bis-salicyloyl-hydrazine as a metal deactivator. 4,446,266, Cl. 524-193.000.

Vonkohlar, John C., IV: *See—*
Tholl, Steven G.; and Vonkohlar, John C., IV, 4,446,460, Cl. 340-825.690.

von Ow, Dieter: *See—*
Eggli, Daniele; von Ow, Dieter; and Huni, Gregor, 4,445,518, Cl. 128-783.000.

Voorhees, John, to Ideal Comfort, Inc. Liquid filled compartmented cushion. 4,445,240, Cl. 5-451.000.

Vorbrueggen, Helmut: *See—*
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,446,147, Cl. 424-274.000.

Vsesojuzny Kardiologichesky Nauchny Tsentr: *See—*
Chazov, Evgeny I.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; Tereshin, Igor M.; Moskvichev, Boris V.; Grinberg, Grigory M.; Skuya, Agris Z.; and Kleiner, Gersh I., 4,446,316, Cl. 536-112.000.

W. H. Brady Co.: *See—*
Savagian, Michael D., 4,446,183, Cl. 428-42.000.

W. Schlafhorst & Co.: *See—*
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.
Rohner, Joachim; and Zumfeld, Heinz, 4,445,319, Cl. 57-22.000.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Schiele, Bernd; and Niedermeier, Johann, 4,445,494, Cl. 125-35.000.

Wadsworth, Donald H.; Thomas, Harold T.; Fletcher, George L.; and Weidner, Charles H., to Eastman Kodak Company. Recording and information record elements comprising oxoindolizine and oxoindolizinium dyes. 4,446,223, Cl. 430-338.000.

Wafer, John A., to Westinghouse Electric Corp. Electrical stab connecting means utilizing eddy current electromagnetic repulsion. 4,445,732, Cl. 339-12.00R.

Wagner, George K., to International Telephone and Telegraph Corporation. Reflector sealing apparatus. 4,446,510, Cl. 362-267.000.

Wakabayashi, Kiyoshige: *See—*
Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,446,239, Cl. 436-532.000.

Walker, Bruce K.; Desai, Mukund; and Gai, Eliezer, to Charles Stark Draper Laboratory, Inc., The. Helicopter swashplate controller. 4,445,421, Cl. 91-186.000.

Walker, John R.: *See—*
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,033, Cl. 252-8.600.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,035, Cl. 252-8.800.

Walker, Raymond L. Wrist pin. 4,445,800, Cl. 403-14.000.

Walker, Thomas S.: *See—*
Hanyzewski, Eugene F.; French, Kenneth A.; and Walker, Thomas S., 4,445,553, Cl. 144-145.00A.

Wall, Nigel G.: *See—*
Hombach, Rudolf; Nolte, Wilfried; Russell, Peter J.; and Wall, Nigel G., 4,445,959, Cl. 156-332.000.

Wallace, Keith L., to Rockwell International Corporation. Circuit board assembly. 4,445,740, Cl. 339-45.00M.

Wallace, Walter A.: *See—*
Huang, Hua-Feng; and Wallace, Walter A., 4,446,348, Cl. 219-10.55A.

Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Alkylation or aromatic compounds. 4,446,329, Cl. 585-458.000.

Walling, John B. Single action pneumatic powered spring retractable pump. 4,445,819, Cl. 417-318.000.

Wandel, Dietmar: *See—*
Koschinek, Gunter; Wandel, Dietmar; Kretschmann, Bernd; and Zinsser, Rolf, 4,446,299, Cl. 528-272.000.

Wang, Ming C.: *See—*
Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, 4,446,122, Cl. 424-1.100.

Waninski, John E., Jr.: *See—*
Bethel, Leslie D.; Kerr, Howard A.; Strebendt, Frances B.; and Waninski, John E., Jr., 4,446,336, Cl. 179-6.100.

Wanlass, Cravens L. Polyphase electric machine having controlled magnetic flux density. 4,446,416, Cl. 318-812.000.

Waragai, Kenichi; Gotoh, Masao; Yokono, Hitoshi; and Iijima, Kazumi, to Hitachi, Ltd. Reaction injection molded article with threads and method of molding same. 4,446,185, Cl. 428-67.000.

Warner Electric Brake & Clutch Company: *See—*
Van Laningham, Kalvin G., 4,445,606, Cl. 192-106.100.

Warner, John L., to United Technologies Corporation. Multi-zone temperature control in air cycle refrigeration systems. 4,445,342, Cl. 62-172.000.

Wasserbach, Max L., to Nabisco Brands, Inc. Method and apparatus for marbleizing an extruded dough. 4,445,835, Cl. 425-131.100.

Wasserman, Myrna D. Teaching method and apparatus. 4,445,869, Cl. 434-156.000.

Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Centrifugal pump having means for counterbalancing unbalanced fluid pressure radial forces on rotor. 4,445,821, Cl. 417-366.000.

Watanabe, Seizou, to Olympus Optical Co., Ltd. Method of manufacturing a magnetic recording film of a thin metallic film type. 4,446,170, Cl. 427-130.000.

Water Services of America, Inc.: *See—*
Baron, Walter J.; and Cleaver, Laird C., 4,445,540, Cl. 137-625.430.

Waterfield, Robert L.: *See—*
Sullivan, Leroy J.; and Waterfield, Robert L., 4,445,418, Cl. 89-33.00D.

Waters, Paul E.; Vaughan, David S.; and Mustico, Carmen J., Jr., to Facet Enterprises, Inc. Electromagnetically released spring applied friction brake with torque booster and driving force distributor. 4,445,596, Cl. 188-171.000.

Watkins, Hugh: *See—*
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,446,060, Cl. 252-522.00R.

Watkinson, James S. Collapsible spinning machine. 4,445,324, Cl. 57-316.000.

Waugh, Robert E., to D. L. Auld Company, The. Trim strip for automobile bodies. 4,446,179, Cl. 428-31.000.

Webb, Donald R. Alignment adapter and support. 4,445,667, Cl. 254-134.000.

Webber, Robert C., to GTE Automatic Electric Labs Inc. Arrangement for multiple custom calling. 4,446,553, Cl. 370-62.000.

Webber, Robert C., to GTE Automatic Electric Labs Inc. Arrangement for multiple custom calling. 4,446,554, Cl. 370-62.000.

Weber, Heinz: *See—*
Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, 4,446,253, Cl. 521-79.000.

Weber, Joseph J.: *See—*
Schratt, John F.; and Weber, Joseph J., 4,445,790, Cl. 374-45.000.

Weber, Reinhold: *See—*
Hahn, Klaus; Weber, Heinz; Guenther, Wolfgang; Schillinger, Bernhard; and Weber, Reinhold, 4,446,253, Cl. 521-79.000.

Weick, Gunter: *See—*
Faber, Johannes W.; and Weick, Gunter, 4,445,752, Cl. 350-96.200.

Weidner, Charles H.: *See—*
Wadsworth, Donald H.; Thomas, Harold T.; Fletcher, George L.; and Weidner, Charles H., 4,446,223, Cl. 430-338.000.

Weiler, Rolf; Bischoff, Gilbert; and Schlag, Rudolf, to ITT Industries, Inc. Low-pressure casing for a brake booster. 4,445,331, Cl. 60-547.100.

Weininger, Joseph L.: *See—*
Kim, Bang M.; and Weininger, Joseph L., 4,445,990, Cl. 204-151.000.

Weisgerber, Gregor; and Steffen, Klaus-Dieter, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of 3-chlorophthalide. 4,446,327, Cl. 549-307.000.

Weiss, Harvey S.: *See—*
Hussein, Hany M. G.; Loeb, Marvin P.; and Weiss, Harvey S., 4,445,892, Cl. 604-101.000.

Welding Engineers, Inc.: *See—*
Rossiter, Paul H., 4,446,094, Cl. 264-349.000.

Wells, James E.: *See—*
Eskinazi, Victoria; and Wells, James E., 4,446,320, Cl. 544-106.000.

Wells, Robert C., to General Electric Company. Tuned coriolis angular rate measuring device. 4,445,375, Cl. 73-504.000.

Wendt, Hans-Joachim, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for loading and unloading an aircraft. 4,446,524, Cl. 364-463.000.

Wennemann, Harald: *See*—
Gohausen, Hans J.; Kirchhoff, Winfried; Lindener, Jurgen; and Wennemann, Harald, 4,445,983, Cl. 204-35.00N.

Wenstrup, Jan F., to Air-Shields, Inc. Infusion pumping apparatus. 4,445,827, Cl. 417-477.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Fischer, Pierre, 4,445,419, Cl. 89-33.00D.

Westerman, Howard: *See*—
Westerman, Howard G.; and Allsopp, Lewis E., 4,445,467, Cl. 123-65.00R.

Westerman, Howard G.; and Allsopp, Lewis E., to Westerman, Howard. Two-cycle stratified charge gas engine. 4,445,467, Cl. 123-65.00R.

Western Electric Co., Inc.: *See*—
Treder, Ralph A., Jr., 4,445,360, Cl. 73-1.0DV.

Westinghouse Electric Corp.: *See*—
Castle, Peter M.; Sweeney, George G.; and Yannopoulos, Lymperios N., 4,446,169, Cl. 427-53.100.
Divens, William C.; and Vacrewyck, Eugene G., 4,445,751, Cl. 350-96.140.
Emery, Franklin T.; Lenderking, Bruce N.; and Couch, Robert D., 4,446,426, Cl. 324-158.0MG.
Flaherty, Robert, 4,445,694, Cl. 277-1.000.
Fox, David A.; and Tipton, Lynn L., 4,446,417, Cl. 322-25.000.
Golub, Gregory J.; and Jenkins, Albert M., 4,446,343, Cl. 200-11.0TC.
Pomaibo, Paul; and Tolino, Ralph W., 4,446,098, Cl. 376-261.000.
Taleff, Alexander; Brady, Robert M.; and Blaszczak, Thaddeus E., 4,445,353, Cl. 72-136.000.
Wafer, John A., 4,445,732, Cl. 339-12.00R.

Wethern, Richard J. Propeller construction. 4,445,817, Cl. 416-227.000.

Wevers, Jean: *See*—
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,033, Cl. 252-8.600.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,446,035, Cl. 252-8.800.

Wharteaby, James C.; Brown, Richard; Rao, Srinivas T.; and Menna, Raymond J., to RCA Corporation. Method for fabricating via connectors through semiconductor wafers. 4,445,978, Cl. 204-15.000.

Wheelock, Kenneth S.; and Schucker, Robert C., to Exxon Research and Engineering Co. Process for regenerating perovskite catalysts and hydrocarbon treating processes utilizing the regenerated catalyst. 4,446,011, Cl. 208-121.000.

White Chemical Corporation: *See*—
Mischutin, Vladimir, 4,446,202, Cl. 428-254.000.

White Consolidated Industries, Inc.: *See*—
Eibe, Werner W., 4,445,349, Cl. 72-17.000.

White, James P.: *See*—
Rutkiewic, Andrew F.; and White, James P., 4,446,044, Cl. 252-170.000.

Whiteside, George D., to Polaroid Corporation. Hybrid camera arrangement. 4,445,763, Cl. 354-417.000.

Whitmire, William E. Oil to gasoline proportioning device for two cycle engines. 4,445,370, Cl. 73-290.00B.

Whitney, William M.: *See*—
Mai, Chao C.; Whitney, William M.; Gosney, William M.; and Gulyas, Donald J., 4,445,266, Cl. 29-571.000.

Whittaker, Gary S.: *See*—
Daniels, Larry C.; and Whittaker, Gary S., 4,446,200, Cl. 428-661.000.

Wichterle, Otto, to Ceskoslovenska akademie ved. Method for measurement of the cavity volume of soft contact lenses and the apparatus for this measuring method. 4,445,362, Cl. 73-37.500.

Wicker, Thomas H.: *See*—
Moore, Louis D.; Rule, Mark; and Wicker, Thomas H., 4,446,303, Cl. 528-308.200.

Wiech, Raymond E., Jr., to Witec Cayman Patents, Ltd. Method of making inelastically compressible ductile particulate material article and subsequent working thereof. 4,445,936, Cl. 75-228.000.

Wiencke, Erich K. Locking device for electrical plugs. 4,445,738, Cl. 339-37.000.

Wierschke, Donald J., to RCA Corporation. Cathode head having improved seal means. 4,445,995, Cl. 204-281.000.

Wilce, Stephen E. Sectional boat joint construction. 4,445,244, Cl. 114-355.00C.

Wilkinson, Samuel C., to Crane Packing Limited. Rotary mechanical seals. 4,445,695, Cl. 277-65.000.

Wilkinson Sword Limited: *See*—
Richards, Richard D., 4,445,610, Cl. 206-349.000.

Willay, Gerard, to Institut de Recherches de la Siderurgie Francaise. Composite crucible. 4,446,563, Cl. 373-157.000.

Willcocks, Kenneth: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,446,113, Cl. 422-267.000.

Willett, Norman F.: *See*—
Lakin, Charles T.; and Willett, Norman F., 4,446,363, Cl. 250-203.00R.

William H. Rorer, Inc.: *See*—
Riley, Richard L., 4,446,152, Cl. 424-322.000.

Williams, Arthur R.; and Johnson, William L., to California Institute of Technology. Versatile focusing radiation analyzer. 4,446,568, Cl. 378-3.000.

Williams, Kenneth E.: *See*—
Denholm, A. Stuart; Frutiger, William A.; and Williams, Kenneth E., 4,446,373, Cl. 250-492.200.

Williams, Marshall; and O'Gwynn, David C., to Ampex Corporation. Quadrature tach decoder circuit. 4,446,389, Cl. 307-515.000.

Williams, Ray J. Knife assembly for producing wood chunks. 4,445,556, Cl. 144-193.00R.

Williamson, Calvin C.: *See*—
Powers, Joseph E.; Grimoldi, Ranaldo H.; Williamson, Calvin C.; and Bottini, Alfred A., 4,445,357, Cl. 72-399.000.

Willis, Donald H., to RCA Corporation. Television receiver ferroresonant load power supply. 4,446,405, Cl. 315-411.000.

Willis, Edwin: *See*—
Beavan, Stuart W.; and Willis, Edwin, 4,445,901, Cl. 8-103.000.

Willis, John G., to Linear Dynamics, Inc. Electronic-pneumatic circuit board coupling. 4,445,536, Cl. 137-560.000.

Wilmington Chemical Corporation: *See*—
Shirk, James E., 4,446,307, Cl. 528-406.000.

Wilms, Gunter: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.

Wilson, Richard C., to Consolidated Cable and Rigging, Inc. Cable tensioning device. 4,445,669, Cl. 254-369.000.

Wilson, Thomas P.: *See*—
Bartley, William J.; and Wilson, Thomas P., 4,446,251, Cl. 518-716.000.

Witec Cayman Patents, Ltd.: *See*—
Wiech, Raymond E., Jr., 4,445,936, Cl. 75-228.000.

Withycombe, Donald A.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,446,032, Cl. 252-8.600.

Witt, Fritz K., to Keiltex Corporation. Apparatus for wet processing textile material in endless rope form. 4,445,346, Cl. 68-178.000.

Witte, Hans H.: *See*—
Sauer, Anton; and Witte, Hans H., 4,446,515, Cl. 364-200.000.

Woestman, John W., to RCA Corporation. System and method for controlling the specific gravity and viscosity of the slurry applied to television picture tube faceplates. 4,445,526, Cl. 137-3.000.

Wolk, Roger S.: *See*—
Bekey, Ivan; and Wolk, Roger S., 4,445,854, Cl. 433-37.000.

Wollnik, Hermann; Haas, Rudiger; and Kassen, Folkert, to Carl Zeiss-Stiftung. Process for the digitization and display of thermographic records. 4,445,516, Cl. 128-736.000.

Wong, George H.: *See*—
Karr, Gerald W.; and Wong, George H., 4,445,646, Cl. 242-56.00R.

Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., to ALZA Corporation. Method for delivering an agent with biocidal activity in a body fluid receiving containers. 4,445,889, Cl. 604-49.000.

Woo, David V., to Hahnemann University. Process of radioimaging the myocardium of mammals utilizing radiolabeled lipophilic cations. 4,446,123, Cl. 424-1.100.

Wood, Eric, to Insituform International Inc. Manufacture of tubular laminates. 4,446,181, Cl. 428-36.000.

Woodruff, Frank, to Bendix Corporation, The. Radial vane pump having variable displacement. 4,445,830, Cl. 418-22.000.

Woods, Richard A.; and Mehta, Rajesh R., to International Paint Public Limited Company. Water dilutable epoxy coating composition. 4,446,260, Cl. 523-409.000.

Wooten, Norman W. Male plug with automatic prong cover. 4,445,739, Cl. 339-42.000.

Worthington, Robert B., to United States of America, Interior. Production of metal powder. 4,445,931, Cl. 75-0.50B.

Wright, David M.; and Ermanski, Albert G., to Wright Line Inc. Document holders. 4,445,799, Cl. 402-4.000.

Wright, John F.: *See*—
Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., 4,446,302, Cl. 528-302.000.

Wright Line Inc.: *See*—
Wright, David M.; and Ermanski, Albert G., 4,445,799, Cl. 402-4.000.

Wu, Anthony W.: *See*—
Afzali-Ardakani, Ali; Crowley, John I.; and Wu, Anthony W., 4,446,193, Cl. 428-422.000.

Wuermli, Arthur, to Rieter Machine Works Limited. Apparatus for the conjoint gripping of bobbins on a ring spinning or ring-twisting machine. 4,445,323, Cl. 57-275.000.

Wunderlich, Klaus: *See*—
Jager, Horst; and Wunderlich, Klaus, 4,446,067, Cl. 260-153.000.

Wustrau, Rolf: *See*—
Bruhn, Peter H.; and Wustrau, Rolf, 4,445,272, Cl. 29-598.000.

Wyoming Mineral Corporation: *See*—
Jardine, Kenneth J.; and Holleman, Robert A., 4,446,114, Cl. 423-10.000.

Xerox Corporation: *See*—
Perna, Theodore P., 4,446,469, Cl. 346-140.00R.
Spinelli, Richard A.; and Glab, Edwin F., 4,445,774, Cl. 355-71.000.

Yada, Yoshikuni: *See*—
Nakao, Masami; Okimoto, Haruo; Yada, Yoshikuni; and Takeshita, Junki, 4,445,474, Cl. 123-336.000.

Yagami, Hiroyuki: *See*—
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Yagi, Shigeki: *See*—
Takaoka, Michio; Ono, Motoyuki; Kaji, Isao; and Yagi, Shigeki, 4,446,331, Cl. 174-73.00R.
Yaguchi, Katsuhiko: *See*—
Mizumoto, Kastuji; and Yaguchi, Katsuhiko, 4,446,439, Cl. 328-140.000.
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, to Nippondenso Co., Ltd. Control circuit for a solenoid-operated actuator. 4,446,410, Cl. 318-687.000.
Yamada, Fumiaki: *See*—
Sato, Kiyoshi; Terashima, Minoru; Sorimachi, Haruo; Naka, Toshiaki; Kanno, Takeo; and Yamada, Fumiaki, 4,446,355, Cl. 219-216.000.
Yamada, Kozo: *See*—
Kawaguchi, Kenji; Hamada, Osamu; Hiramoto, Seigo; Kato, Yukio; and Yamada, Kozo, 4,446,351, Cl. 219-69.00W.
Yamada, Mitsumasa: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,445,488, Cl. 123-569.000.
Yamada, Yoshitsugu: *See*—
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,446,133, Cl. 424-250.000.
Yamaguchi, Keiki; Takeuchi, Yasuhito; Sano, Shinichi; and Higashiizumi, Takao, to Yokogawa Hokushin Electric Corporation. Apparatus for receiving reflected ultrasonic waves in ultrasonography. 4,445,379, Cl. 73-631.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Imani, Yuichi, 4,445,585, Cl. 180-68.500.
Matsumoto, Hiromitsu, 4,445,473, Cl. 123-308.000.
Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Camera incorporating photo-electro transducer. 4,445,765, Cl. 354-478.000.
Yamamoto, Kenji, to Electroplating Engineers of Japan, Limited. Plating apparatus. 4,445,992, Cl. 204-203.000.
Yamamoto, Ryoichi: *See*—
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, 4,446,410, Cl. 318-687.000.
Yamamoto, Shoji: *See*—
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Yamamuro, Kiyohiko: *See*—
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Yamane, Keiji: *See*—
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Yamanishi, Yoshio: *See*—
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Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Maeda, Hiroshi; and Nishi, Katsuhide, 4,446,136, Cl. 424-177.000.
Yamasaki, Harumasa; and Harada, Shoichiro, to Kao Soap Co., Ltd. Process for preparation of high water-absorbent polymer beads. 4,446,261, Cl. 524-40.000.
Yamashita, Kiyoshi; and Iijima, Toshifumi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive color photographic material. 4,446,226, Cl. 430-506.000.
Yamashita, Masashi: *See*—
Ishii, Tetsuro; Oyama, Tadanori; Yamashita, Masashi; Kzome, Kazuyuki; Ikeda, Tsutomu; and Fujioka, Satoru, 4,445,981, Cl. 204-18.100.
Yamashita, Toshio: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; and Yamashita, Toshio, 4,446,121, Cl. 423-644.000.
Yamazaki, Shogo, to Orinox Co., Ltd. Binoculars with a detachable small camera. 4,445,766, Cl. 354-79.000.
Yang, Kim W., to Ralston Purina Company. Skin sanitizing composition and method of using. 4,446,153, Cl. 424-343.000.
Yannopoulos, Lymperios N.: *See*—
Castle, Peter M.; Sweeney, George G.; and Yannopoulos, Lymperios N., 4,446,169, Cl. 427-53.100.
Yano, Takashi, to Ricoh Company, Ltd. Electrostatic recording method and apparatus therefor. 4,446,471, Cl. 346-153.100.
Yaotani, Kouichi; and Ogawa, Yasuyuki, to Nissan Motor Co., Ltd.; and Kato Hatsujo Kaisha Ltd. Draining mechanism for automotive door. 4,445,721, Cl. 296-154.000.
Yapp, Robert E.; and Smith, Derek J., to Massey-Ferguson Services N.V. Control lever arrangements. 4,445,394, Cl. 74-501.00R.
Yasui Sangyo Co., Ltd.: *See*—
Suzuki, Yasunori, 4,445,554, Cl. 144-193.00A.
Yataki, Masamichi; Dack, Glen W. D.; and Ertl, Paul S., to Northern Telecom Limited. Adjustable reel. 4,445,649, Cl. 242-118.200.
Yau, Wallace W.: *See*—
Dilks, Charles H., Jr.; and Yau, Wallace W., 4,446,014, Cl. 209-155.000.
Yazaki, Komei: *See*—
Fukushima, Masao; and Yazaki, Komei, 4,445,662, Cl. 248-559.000.
Yeadon, David A., to United States of America, Agriculture; and United States of America, Agriculture. Vapor process for mineral dyeing cellulosic fabrics. 4,445,902, Cl. 8-474.000.
Yellow Springs Instrument Company, Inc., The: *See*—
Fullam, Philip S., 4,445,742, Cl. 339-61.00M.
Yerushalmi, Shmuel: *See*—
Krupka, Yaakov; Feldman, Salomon; and Yerushalmi, Shmuel, 4,445,512, Cl. 128-419.0PT.
Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,445,930, Cl. 71-105.000.
Ying, Lincoln; and Carter, Thomas P., Jr., to Celanese Corporation. Sized carbon fibers suitable for use in composites of improved impact resistance. 4,446,255, Cl. 523-205.000.
Yokogawa Hokushin Electric Corporation: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Sano, Shinichi; and Higashiizumi, Takao, 4,445,379, Cl. 73-631.000.
Yokokawa, Harumi: *See*—
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; Fukuda, Kenzo; and Motoe, Akihiro, 4,445,934, Cl. 75-68.00A.
Yokono, Hitoshi: *See*—
Waragai, Kenichi; Gotoh, Masao; Yokono, Hitoshi; and Iijima, Kazumi, 4,446,185, Cl. 428-67.000.
Yokoyama, Junichi: *See*—
Inoue, Mitsumasa; Nakamura, Ken; Yokoyama, Junichi; and Yonezawa, Atsushi, 4,445,480, Cl. 123-432.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier circuit. 4,446,442, Cl. 330-149.000.
Yokoyama, Shoji: *See*—
Miki, Nobuaki; and Yokoyama, Shoji, 4,445,528, Cl. 137-315.000.
Yonezawa, Atsushi: *See*—
Inoue, Mitsumasa; Nakamura, Ken; Yokoyama, Junichi; and Yonezawa, Atsushi, 4,445,480, Cl. 123-432.000.
York-Shipley, Inc.: *See*—
Richard, Kenneth L., 4,445,914, Cl. 55-303.000.
Yoshida, Kazutaka: *See*—
Sugiyama, Masatoshi; Yoshida, Kazutaka; and Ogawa, Akira, 4,446,470, Cl. 346-140.00R.
Yoshida, Seietsu: *See*—
Yagura, Toshiaki; Satoyama, Kenichiro; Morisada, Kazutoshi; Yamamoto, Ryoichi; and Yoshida, Seietsu, 4,446,410, Cl. 318-687.000.
Yoshikumi, Chikao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,446,137, Cl. 424-246.000.
Yoshimaru, Tomohisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Information recording system. 4,446,492, Cl. 360-48.000.
Young, Donald C., to Union Oil Company of California. Methods of producing concentrated urea-sulfuric acid reaction products. 4,445,925, Cl. 71-28.000.
Youngner, Daniel W.: *See*—
Carlson, Robert J.; and Youngner, Daniel W., 4,445,966, Cl. 156-643.000.
Yowfoo, Joseph: *See*—
Berg, Ellie; and Yowfoo, Joseph, 4,445,867, Cl. 434-404.000.
Yu, Terry T., to Energy Conversion Devices, Inc. Tellurium imaging composition including alcohol. 4,446,224, Cl. 430-346.000.
Zachariadis, Robert G., to Mobil Oil Corporation. Marine cable location system. 4,446,538, Cl. 367-19.000.
Zaita, Katsuyuki; and Iwao, Suminari, to Honda Giken Kogyo Kabushiki Kaisha. Carburetion system for V-type internal combustion engines. 4,445,466, Cl. 123-59.0PC.
Zenith Radio Corporation: *See*—
Johnson, Fred D.; Flasza, Michael D.; and Tzakis, George J., 4,446,443, Cl. 330-257.000.
Srivastava, Gopal K.; and Lai, Stephen H., 4,446,482, Cl. 358-150.000.
Zermeno, Alfonso: *See*—
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,446,365, Cl. 250-213.00R.
Zerwekh, Paul S.: *See*—
Claus, Richard O.; and Zerwekh, Paul S., 4,446,396, Cl. 310-334.000.
Zeunert, Fritz: *See*—
Pfeiffer, Gerd; Stinnertz, Horst; and Zeunert, Fritz, 4,445,354, Cl. 72-208.000.
Zichy, Erno L.: *See*—
Smallwood, Peter V.; and Zichy, Erno L., 4,446,287, Cl. 526-81.000.
Zidon, Amicam C.: *See*—
Katz, Carlos; and Zidon, Amicam C., 4,446,095, Cl. 264-558.000.
Ziegler, Klaus: *See*—
Bernauer, Otto; and Ziegler, Klaus, 4,446,101, Cl. 420-424.000.
Zilog, Inc.: *See*—
Dalrymple, Monte J., 4,446,381, Cl. 307-200.00B.
Zimmer, Mark D., to Halliburton Company. Acoustic well logging with energy level detection. 4,446,540, Cl. 367-26.000.
Zimmerman, Edwin H. Gas generating system and process. 4,445,910, Cl. 48-76.000.
Zinsser, Rolf: *See*—
Koschinek, Gunter; Wandel, Dietmar; Kretschmann, Bernd; and Zinsser, Rolf, 4,446,299, Cl. 528-272.000.
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Stolyar, Eduard A.; Kushelman, Vladimir S.; Dreishev, Igor I.; Abaskalov, Vladimir D.; Levinson, Vladimir A.; Ivanov, Vladimir A.; and Morozov, Jury E., to Tsentralnoe Proektno-Konstruktorskoe I Tekhnologicheskoe Bjuro. Machine for making mould cores from flowable core sand mixtures in hot multiple core boxes. 4,445,564, Cl. 164-186.000.
Zollner, Dieter; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, to Arc Technologies Systems, Ltd. Axially movable electrode holder for use in electric steel production. 4,446,561, Cl. 373-93.000.

Zubrzycki, Leonard J., to Temple University of the Commonwealth System of Higher Education. Test method for the laboratory diagnosis of Gonorrhea and test strain of *neisseria gonorrhoeae*. 4,446,230, Cl. 435-6.000.

Zuckerwar, Allan J., to United States of America, National Aeronautics and Space Administration. Acoustic ground impedance meter. 4,445,378, Cl. 73-589.000.

Zumfeld, Heinz: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,445,318, Cl. 57-22.000.
Rohner, Joachim; and Zumfeld, Heinz, 4,445,319, Cl. 57-22.000.

Zyduck, Ronald L., to Acorn Equipment Corp. Animal waste pumping system. 4,445,823, Cl. 417-430.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

B. F. Goodrich Company, The: *See*—
Riew, Changkiu K., Re. 31,577, Cl. 523-514.000.

Babcock & Wilcox Company, The: *See*—
Coulter, Earl E.; Hemker, Fritz L.; and Kazmierski, Elias A., Re. 31,572, Cl. 222-1.000.

Coulter, Earl E.; Hemker, Fritz L.; and Kazmierski, Elias A., to Babcock & Wilcox Company, The. Pulverized fuel delivery system for a blast furnace. Re. 31,572, Cl. 222-1.000.

Cuprinol Limited: *See*—
Hilditch, Edward A., Re. 31,576, Cl. 424-141.000.

Dale, John M.: *See*—
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., Re. 31,575, Cl. 106-287.320.

Drexel, Charles F., to Tylan Corporation. Fluid flowmeter. Re. 31,570, Cl. 73-202.000.

Eastman Kodak Company: *See*—
Sethi, Gurdip S., Re. 31,573, Cl. 354-121.000.

Eaton Corporation: *See*—
Jaeschke, James R., Re. 31,579, Cl. 335-151.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. Re. 31,569, Cl. 29-407.000.

Frazier, Henry F.: *See*—
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., Re. 31,575, Cl. 106-287.320.

Hemker, Fritz L.: *See*—
Coulter, Earl E.; Hemker, Fritz L.; and Kazmierski, Elias A., Re. 31,572, Cl. 222-1.000.

Hilditch, Edward A., to Cuprinol Limited. Compositions containing preservative metals and their use for the preservation of wood and like materials and as fungicides. Re. 31,576, Cl. 424-141.000.

Jaeschke, James R., to Eaton Corporation. Shutterless fiber optic switch. Re. 31,579, Cl. 335-151.000.

Kazmierski, Elias A.: *See*—
Coulter, Earl E.; Hemker, Fritz L.; and Kazmierski, Elias A., Re. 31,572, Cl. 222-1.000.

Kelly, Robert C.; and Wierenga, Wendell, to Upjohn Company, The. α(Substituted) amino-3-substituted-2-isoxazoline-5-acetic acids (esters). Re. 31,578, Cl. 548-240.000.

Kooi, Else, to U.S. Philips Corporation. Insulated gate field-effect transistor comprising a mesa channel and a thicker surrounding oxide. Re. 31,580, Cl. 357-23.000.

Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., to Southwest Research Institute. Sulfur compounds and method of making same. Re. 31,575, Cl. 106-287.320.

Mann, Anne V. Multiple compartment packaging. Re. 31,571, Cl. 206-443.000.

Owens-Corning Fiberglas Corporation: *See*—
Seng, Stephen, Re. 31,574, Cl. 425-141.000.

Riew, Changkiu K., to B. F. Goodrich Company, The. Reactive terminally unsaturated liquid polymers in unsaturated polyesters. Re. 31,577, Cl. 523-514.000.

Rockwell International Corporation: *See*—
Eshghy, Siavash, Re. 31,569, Cl. 29-407.000.

Seng, Stephen, to Owens-Corning Fiberglas Corporation. Apparatus for handling heat-softenable batch material. Re. 31,574, Cl. 425-141.000.

Sethi, Gurdip S., to Eastman Kodak Company. Film cartridge assembly with pressure plate. Re. 31,573, Cl. 354-121.000.

Southwest Research Institute: *See*—
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., Re. 31,575, Cl. 106-287.320.

Tylan Corporation: *See*—
Drexel, Charles F., Re. 31,570, Cl. 73-202.000.

U.S. Philips Corporation: *See*—
Kooi, Else, Re. 31,580, Cl. 357-23.000.

Upjohn Company, The: *See*—
Kelly, Robert C.; and Wierenga, Wendell, Re. 31,578, Cl. 548-240.000.

Wierenga, Wendell: *See*—
Kelly, Robert C.; and Wierenga, Wendell, Re. 31,578, Cl. 548-240.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Amchem Products, Inc.: *See*—
Dollman, David Y., B1 3,549,540, Cl. 252-105.000.

Baxter Travenol Laboratories, Inc.: *See*—
Carpenter, Walter L., B1 4,198,080, Cl. 285-277.000.

Bodendorf, Warren J., to Texon Inc. Decay resistant sheet material with retained flexibility. B1 4,315,798, 5-1-84, Cl. 162-161.000.

Carpenter, Walter L., to Baxter Travenol Laboratories, Inc. Telescoping-type connector. B1 4,198,080, 5-1-84, Cl. 285-277.000.

Dollman, David Y., to Amchem Products, Inc. Method and compositions for treating aluminum surfaces. B1 3,549,540, 5-1-84, Cl. 252-105.000.

Frase, Roland J.: *See*—
Johnson, Otto E.; Frase, Roland J.; and Morkoski, James, B1 3,321,027, Cl. 172-260.500.

International Harvester Company: *See*—
Johnson, Otto E.; Frase, Roland J.; and Morkoski, James, B1 3,321,027, Cl. 172-260.500.

Johnson, Otto E.; Frase, Roland J.; and Morkoski, James, to International Harvester Company. Self-restoring plow trip. B1 3,321,027, 5-1-84, Cl. 172-260.500.

Morkoski, James: *See*—
Johnson, Otto E.; Frase, Roland J.; and Morkoski, James, B1 3,321,027, Cl. 172-260.500.

Texon Inc.: *See*—
Bodendorf, Warren J., B1 4,315,798, Cl. 162-161.000.

LIST OF DESIGN PATENTEES

AB Svenska Flaktfabriken: *See*—
Widerby, Lennart; and Carlsson, Sven H., 273,702, Cl. D23-163.000.

Acrow (Engineers) Limited: *See*—
Young, George B. A., 273,711, Cl. D25-73.000.

Ahlqvist, Claes. Base for a column. 273,712, 5-1-84, Cl. D25-77.000.

American Standard Inc.: *See*—
Bengtson, Hertha A., 273,701, Cl. D23-67.000.

Aulenti, Gea. Front panel face for a windowed exhibit case. 273,648, 5-1-84, Cl. D6-192.000.

Avant, Charles T.; Benedetti, Robert L.; Genaro, Donald M.; and McGarvey, John N., to Western Electric Company, Inc. Modular

telephone enclosure and privacy wing therefor. 273,646, 5-1-84, Cl. D6-181.000.
Avantgarde S.p.A.: *See*—
Stocchi, Gabriele, 273,635, Cl. D4-25.000.
Benedetti, Robert L.; and Novak, Lajos, to Western Electric Co., Inc. Acoustic telephone enclosure and canopy therefor. 273,637, 5-1-84, Cl. D6-25.000.
Benedetti, Robert L.: *See*—
Avant, Charles T.; Benedetti, Robert L.; Genaro, Donald M.; and McGarvey, John N., 273,646, Cl. D6-181.000.
Bengtson, Hertha A., to American Standard Inc. Toilet. 273,701, 5-1-84, Cl. D23-67.000.
Betz Laboratories, Inc.: *See*—
Moyse, K. Robert, 273,703, Cl. D24-1.100.
Bidegain, Pierre, to Bidegain S.A. Shoe. 273,630, 5-1-84, Cl. D2-309.000.
Bidegain S.A.: *See*—
Bidegain, Pierre, 273,630, Cl. D2-309.000.
Boeing Company, The: *See*—
Olason, Ray; and Whitener, Philip C., 273,673, Cl. D12-338.000.
Brandon, Larry L. Cable T.V. connector for marine vessel hulls or the like. 273,674, 5-1-84, Cl. D13-24.000.
Brown, Dwight C. Hanger for skirts, slacks or trousers. 273,650, 5-1-84, Cl. D6-252.000.
Cafiero, Vincent, to Simmons Universal Corporation. Chair. 273,639, 5-1-84, Cl. D6-30.000.
Carlsson, Sven H.: *See*—
Widerby, Lennart; and Carlsson, Sven H., 273,702, Cl. D23-163.000.
Carrera International Corporation: *See*—
Dianitsch, Franz, 273,684, Cl. D16-102.000.
Cassai, Gino H.; and Cassai, Henry J. Adjustable cosmetic applicator. 273,716, 5-1-84, Cl. D28-7.000.
Cassai, Henry J.: *See*—
Cassai, Gino H.; and Cassai, Henry J., 273,716, Cl. D28-7.000.
Catawba Sox, Inc.: *See*—
Drum, Forrest E., 273,633, Cl. D2-334.000.
Chu, Alan C. Double hole brush handle. 273,636, 5-1-84, Cl. D4-38.000.
Coca-Cola Company, The: *See*—
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 273,654, Cl. D7-307.000.
Colavito, Ann M.; and Galizia, Alphonse. Foil dispenser. 273,644, 5-1-84, Cl. D6-96.000.
Container Engineering (Ireland) Limited: *See*—
Fossey, Robin E., 273,693, Cl. D23-2.000.
Cothran, William B.: *See*—
Safrit, Sam C.; and Cothran, William B., 273,687, Cl. D20-32.000.
Crosby, Samuel C.: *See*—
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 273,654, Cl. D7-307.000.
Dart Container Corporation: *See*—
Emrick, Tobin L., 273,651, Cl. D7-6.000.
Day, Curtis H.: *See*—
Loup, Ronald L.; Day, Curtis H.; and Schick, George L., 273,699, Cl. D23-19.000.
Dellinger, Henry P. Rotary cultivating tool. 273,656, 5-1-84, Cl. D8-8.000.
Dianitsch, Franz, to Carrera International Corporation. Sport glasses. 273,684, 5-1-84, Cl. D16-102.000.
Di Geronimo, Eugene R., III. Roadster. 273,668, 5-1-84, Cl. D12-92.000.
Double A Products Company: *See*—
Loup, Ronald L.; Day, Curtis H.; and Schick, George L., 273,699, Cl. D23-19.000.
Drum, Forrest E., to Catawba Sox, Inc. Cuff portion of a knitted sock. 273,633, 5-1-84, Cl. D2-334.000.
Dugan, Elizabeth. Cat litter box. 273,718, 5-1-84, Cl. D30-99.000.
Emrick, Tobin L., to Dart Container Corporation. Beverage cup. 273,651, 5-1-84, Cl. D7-6.000.
English, David C.: *See*—
Sly, Eugene L.; and English, David C., 273,665, Cl. D10-91.000.
Fagersta AB: *See*—
Kangas, Karl-Erik, 273,680, Cl. D15-21.000.
Fairchild Industries, Inc.: *See*—
Marrujo, Ralph G., 273,642, Cl. D6-48.000.
Finch, Delos L. Wade fishing boot. 273,624, 5-1-84, Cl. D2-275.000.
Forbis, David E. Recreational shell for mounting in the bed of a pickup truck. 273,669, 5-1-84, Cl. D12-156.000.
Ford, John B. M. Spoiler for a vehicle and the like. 273,671, 5-1-84, Cl. D12-181.000.
Fossey, Robin E., to Container Engineering (Ireland) Limited. Tank for fluids. 273,693, 5-1-84, Cl. D23-2.000.
Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 273,690, Cl. D22-23.000.
Ohmura, Ryuichi, 273,692, Cl. D22-24.000.
Galizia, Alphonse: *See*—
Colavito, Ann M.; and Galizia, Alphonse, 273,644, Cl. D6-96.000.
Gannett Co., Inc.: *See*—
Gore, Fred M., 273,686, Cl. D20-6.000.
Genaro, Donald M.: *See*—
Avant, Charles T.; Benedetti, Robert L.; Genaro, Donald M.; and McGarvey, John N., 273,646, Cl. D6-181.000.
Gore, Fred M., to Gannett Co., Inc. Newspaper vending rack or similar article. 273,686, 5-1-84, Cl. D20-6.000.
Grae, Bernard A., to Tandy Corporation. Computer housing. 273,679, 5-1-84, Cl. D14-106.000.
Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 273,717, Cl. D29-06.000.
Hanks, Robert E. Screw starter. 273,657, 5-1-84, Cl. D8-82.000.
Hans Grohe GmbH & Co.: *See*—
Haug, Andreas, 273,708, Cl. D24-36.000.
Hart Chemical Limited: *See*—
Widmer, Fredi, 273,661, Cl. D9-374.000.
Haruguchi, Kenichi; Miyake, Takao; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,655, 5-1-84, Cl. D7-351.000.
Hasegawa, Sigeru: *See*—
Itoh, Masafumi; Hasegawa, Sigeru; Takita, Haruki; and Suzuki, Kouzi, 273,676, Cl. D14-1.000.
Haug, Andreas, to Hans Grohe GmbH & Co. Massage apparatus. 273,708, 5-1-84, Cl. D24-36.000.
Hayashi, Keiko, to Masami Hayashi; and Hayashi, Keiko. Ornament for a finger nail. 273,666, 5-1-84, Cl. D11-1.000.
Hendren, C. Dalton: *See*—
Hendren, Connie D.; and Hendren, C. Dalton, 273,683, Cl. D16-1.000.
Hendren, Connie D.; and Hendren, C. Dalton. Combined camera, flashlight, and clock-radio. 273,683, 5-1-84, Cl. D16-1.000.
Hoffmann, Rolf, to Princeton Sportwear Corporation. Button. 273,634, 5-1-84, Cl. D2-449.000.
Hollister Incorporated: *See*—
Schneider, Barry L., 273,709, Cl. D24-59.000.
Holoubek, Andrew J.: *See*—
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 273,654, Cl. D7-307.000.
Horn, Dieter H. G. Slipper. 273,629, 5-1-84, Cl. D2-282.000.
Huberman, Stephen; and Lasky, Daniel. Sneaker. 273,627, 5-1-84, Cl. D2-282.000.
Huberman, Stephen; and Lasky, Daniel. Sneaker. 273,628, 5-1-84, Cl. D2-282.000.
Ito, Sotoya, to Ofuna Industry Co., Ltd. Dado saw blade. 273,681, 5-1-84, Cl. D15-133.000.
Itoh, Masafumi; Hasegawa, Sigeru; Takita, Haruki; and Suzuki, Kouzi, to Teac Corporation. Audio mixer. 273,676, 5-1-84, Cl. D14-1.000.
Iversen, Alfred A.: *See*—
Spetzler, Robert F.; and Iversen, Alfred A., 273,705, Cl. D24-26.000.
Johnson, Dennis E. J.; and Johnson, Scott J. Water purification ionic gas generator. 273,694, 5-1-84, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J. Water purification ionic gas generator. 273,695, 5-1-84, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J. Water purification ionic gas generator. 273,696, 5-1-84, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J. Combination filter and ionic gas generator assembly for purifying machine tool coolants. 273,697, 5-1-84, Cl. D23-3.000.
Johnson, Scott J.: *See*—
Johnson, Dennis E. J.; and Johnson, Scott J., 273,694, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J., 273,695, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J., 273,696, Cl. D23-3.000.
Johnson, Dennis E. J.; and Johnson, Scott J., 273,697, Cl. D23-3.000.
Kahn, Evan R. Combined container cap and applicator. 273,663, 5-1-84, Cl. D9-447.000.
Kandarian, Richard. Wine rack. 273,647, 5-1-84, Cl. D6-188.000.
Kangas, Karl-Erik, to Fagersta AB. Roller bit. 273,680, 5-1-84, Cl. D15-21.000.
Kayser-Roth Hosiery, Inc.: *See*—
Safrit, Sam C.; and Cothran, William B., 273,687, Cl. D20-32.000.
Keil, Richard E. Retractable truck box cover. 273,670, 5-1-84, Cl. D12-156.000.
Keiser, Bruce, to Keiser Sterling Corporation. Table. 273,638, 5-1-84, Cl. D6-27.000.
Keiser Sterling Corporation: *See*—
Keiser, Bruce, 273,638, Cl. D6-27.000.
Knoll International, Inc.: *See*—
Stephens, William I., 273,641, Cl. D6-47.000.
Lasky, Daniel: *See*—
Huberman, Stephen; and Lasky, Daniel, 273,627, Cl. D2-282.000.
Huberman, Stephen; and Lasky, Daniel, 273,628, Cl. D2-282.000.
Lassiter, Will M. Cutting bit. 273,682, 5-1-84, Cl. D15-139.000.
Lawler, Chris B.: *See*—
Miller, Joseph E.; Mandel, Andrea S.; and Lawler, Chris B., 273,704, Cl. D24-26.000.
LeBlanc, Nathan J. Portable stage. 273,710, 5-1-84, Cl. D25-58.000.
Lederman, David M.: *See*—
Lederman, Susan F.; and Lederman, David M., 273,652, Cl. D7-17.000.
Lederman, Susan F.; and Lederman, David M. Fruit ripener. 273,652, 5-1-84, Cl. D7-17.000.
Loup, Ronald L.; Day, Curtis H.; and Schick, George L., to Double A Products Company. Solenoid operated valve. 273,699, 5-1-84, Cl. D23-19.000.
Lund, Allan W. Windshield visor for trucks. 273,672, 5-1-84, Cl. D12-191.000.
Luong, Minh: *See*—
Vuarnesson, Bernard; Luong, Minh; and Rabinowitz, Joel, 273,667, Cl. D11-155.000.

Mandel, Andrea S.: *See*—
Miller, Joseph E.; Mandel, Andrea S.; and Lawler, Chris B., 273,704, Cl. D24-26.000.
Marrujo, Ralph G., to Fairchild Industries, Inc. Aircraft seat. 273,642, 5-1-84, Cl. D6-48.000.
Marterie, Anthony J. Knitted slipper. 273,625, 5-1-84, Cl. D2-279.000.
Marterie, Anthony J. Knitted slipper. 273,626, 5-1-84, Cl. D2-279.000.
Martinsen, Lyle J., to Softalk, Inc. Telephone shoulder rest. 273,677, 5-1-84, Cl. D14-65.000.
Masami Hayashi: *See*—
Hayashi, Keiko, 273,666, Cl. D11-1.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Nishimoto, Teruyuki; Ohta, Kikuo; and Mishiro, Benito, 273,678, Cl. D14-73.000.
McCall, Francis J. Ear mounted electrical pulse acupressure apparatus. 273,706, 5-1-84, Cl. D24-35.000.
McCall, Francis J. Electrically stimulated acupressure apparatus to be located within the ear. 273,707, 5-1-84, Cl. D24-35.000.
McCombs, Norman R., to Greene & Kellogg, Inc. Compact medical oxygen concentrator. 273,717, 5-1-84, Cl. D29-06.000.
McEvers, Wilber C. Tie rack. 273,645, 5-1-84, Cl. D6-117.000.
McGarvey, John N.: *See*—
Avant, Charles T.; Benedetti, Robert L.; Genaro, Donald M.; and McGarvey, John N., 273,646, Cl. D6-181.000.
McKinnon, Eugene T. Heater end cap. 273,675, 5-1-84, Cl. D13-27.000.
Mead Corporation, The: *See*—
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98 4,445,986
4,445,987
129.2 4,445,988
147 4,445,989
151 4,445,990
168 4,445,991
203 4,445,992
213 4,445,993
258 4,445,994
281 4,445,995
294 4,445,996
298 4,445,997
414 4,445,999
415 4,446,000

CLASS 206

277 4,445,609
349 4,445,610
369 4,445,611
387 4,445,612
418 4,445,613
443 Re.31,571
599 4,445,614

CLASS 208

11 R 4,446,001
23 4,446,002
48 Q 4,446,003
57 4,446,004
91 4,446,005
111 4,446,007
4,446,008
113 4,446,009
120 4,446,010
121 4,446,011
130 4,446,012
135 4,446,013
253 4,446,006

CLASS 209

155 4,446,014
4,446,015
555 4,445,615

CLASS 210

86 4,446,016
90 4,446,017
195.4 4,446,018
223 4,446,019
225 4,446,020
378 4,446,021
388 4,446,022
400 4,446,023
500.2 4,446,024
602 4,446,025
639 4,446,026
661 4,446,027
697 4,446,028
748 4,446,029
805 4,446,030

CLASS 211

13 4,445,616

CLASS 213

60 4,445,617
61 4,445,618

CLASS 219

10.55 A 4,446,348
10.55 F 4,446,349
10.77 4,446,350
69 W 4,446,351
121 LC 4,446,352
125.12 4,446,353
130.01 4,446,354
216 4,446,355
272 4,446,356
275 4,446,357
388 4,446,358
421 4,446,360
485 4,446,359

CLASS 220

263 4,445,619
271 4,445,620
273 4,445,621
306 4,445,622
343 4,445,623
449 4,445,624

CLASS 221

241 4,445,625

CLASS 222

1 Re.31,572
39 4,445,626
54 4,445,627
66 4,445,628
148 4,445,629
464 4,445,630

CLASS 223

1 4,445,631

CLASS 225

2 4,445,632

CLASS 228

102 4,445,633

CLASS 229

40 4,445,634
73 4,445,635

CLASS 235

78 N 4,446,361
462 4,446,362

CLASS 236

20 R 4,445,636
49 4,445,637

CLASS 237

8 R 4,445,638
81 4,445,639

CLASS 238

8 4,445,640

CLASS 239

6 4,445,641
64 4,445,642
197 4,445,643

CLASS 241

99 4,445,644

CLASS 242

55.53 4,445,645
56 R 4,445,646
68.4 4,445,647
107.6 4,445,648
118.2 4,445,649
192 4,445,650
199 4,445,651

CLASS 244

1 R 4,445,652
110 D 4,445,653
139 4,445,654
214 4,445,655

CLASS 248

49 4,445,656
73 4,445,657
99 4,445,658
210 4,445,659
335 4,445,660
394 4,445,661
559 4,445,662
652 4,445,663

CLASS 250

203 R 4,446,363
211 R 4,446,364
213 R 4,446,365
227 4,446,366
231 SE 4,446,367
262 4,446,368
270 4,446,369
301 4,446,370
324 4,446,371
334 4,446,372
492.2 4,446,373
492.3 4,446,374
551 4,446,375

CLASS 251

149.2 4,445,664

CLASS 252

1 4,446,031
8.55 D 4,446,036
8.6 4,446,032
4,446,033
8.8 4,446,034
4,446,035
33.6 4,446,053
47.5 4,446,037
51.5 A 4,446,038
52 R 4,446,039
62 4,446,040
70 4,446,041
102 4,446,042
105 4,446,043
B1 43,549,540
170 4,446,044
180 4,446,045
181 4,446,046
299.1 4,446,047
301.4 S 4,446,048
301.6 P 4,446,049
309 4,446,051
315.1 4,446,052
344 4,446,054
351 4,446,055
391 4,446,056
507 4,446,058
514 4,446,059
522 R 4,446,060
602 4,446,061
609 4,446,062
633 4,446,063

CLASS 254

88 4,445,665
93 H 4,445,666
134 4,445,667
287 4,445,668
369 4,445,669

CLASS 260

112 B 4,446,066
112 R 4,446,064
4,446,065
153 4,446,067
239 E 4,446,068
245.2 R 4,446,069
369 4,446,070
397.3 4,446,071
397.45 4,446,072
409 4,446,073
429 R 4,446,074
465 F 4,446,078
465 G 4,446,075
4,446,076
465 K 4,446,077
513 R 4,446,079

CLASS 261

39 D 4,446,080
64 R 4,446,081

CLASS 264

30 4,446,082
32 4,446,083
40.6 4,446,084
108 4,446,085
118 4,446,086
148 4,446,087
155 4,446,088
178 F 4,446,089
211 4,446,090
225 4,446,091
258 4,446,092
315 4,446,093
349 4,446,094
385 4,445,998
558 4,446,095

CLASS 266

80 4,445,670

CLASS 267

64.12 4,445,671
64.16 4,445,672
64.24 4,445,673
141 4,445,674

CLASS 269

20 4,445,675
32 4,445,676
41 4,445,677
88 4,445,678

CLASS 271

227 4,445,679
290 4,445,680
300 4,445,681
301 4,445,682

CLASS 272

69 4,445,683
134 4,445,684

CLASS 273

26 R 4,445,685
29 A 4,445,686
72 R 4,445,687
82 R 4,445,688
118 R 4,445,689
4,445,690
155 4,445,691
256 4,445,692
404 4,445,693

CLASS 277

1 4,445,694
65 4,445,695
80 4,445,696

CLASS 279

1 A 4,445,697

CLASS 280

11.115 4,445,698
87.04 R 4,445,699
154.5 R 4,445,700
217 4,445,701
239 4,445,702
279 4,445,703
292 4,445,704
302 4,445,705
411 C 4,445,706
687 4,445,707
777 4,445,708
801 4,445,709

CLASS 281

45 4,445,710

CLASS 283

1 R 4,445,711
75 4,445,712

CLASS 285

14 4,445,713
23 4,445,714
54 4,445,715
55 4,445,716
277 B1 4,198,080

CLASS 290

44 4,446,376
52 4,446,377
54 4,446,378
55 4,446,379

CLASS 292

177 4,445,717
341.17 4,445,718

CLASS 294

88 4,445,719

CLASS 296

37.12 4,445,720
154 4,445,721

CLASS 297

468 4,445,722

CLASS 299

11 4,445,723
81 4,445,724

CLASS 303

6 C 4,445,725

CLASS 307

10 AT 4,446,380
200 B 4,446,381
241 4,446,382
297 4,446,383
4,446,384
355 4,446,385
449 4,446,386
450 4,446,387
511 4,446,388
515 4,446,389
579 4,446,390

CLASS 308

3.8 4,445,726
4 A 4,445,727

CLASS 310

62 4,446,391
105 4,446,392
184 4,446,393
321 4,446,394
327 4,446,395
334 4,446,396

CLASS 312

1 4,445,728
214 4,445,730
219 4,445,729
223 4,445,731

CLASS 313

25 4,446,397
346 R 4,446,404
390 4,446,398
505 4,446,399
517 4,446,400
533 4,446,401
586 4,446,402

CLASS 315

111.81 4,446,403
411 4,446,405

CLASS 318

254 4,446,406
282 4,446,407
600 4,446,408
632 4,446,409
687 4,446,410
696 4,446,411
4,446,412
4,446,413
723 4,446,414
798 4,446,415
812 4,446,416

CLASS 322

4 4,446,418
25 4,446,417

CLASS 323

316 4,446,419

CLASS 324

52 4,446,420
4,446,421
54 4,446,422
60 C 4,446,423
62 4,446,424
71.5 4,446,432
77 K 4,446,425
158 MG 4,446,426
207 4,446,427
304 4,446,428
316 4,446,429
318 4,446,431
321 4,446,430
338 4,446,433
363 4,446,434
453 4,446,435

CLASS 328

14 4,446,436
120 4,446,437
127 4,446,438
140 4,446,439

CLASS 330

10 4,446,440
149 4,446,441
4,446,442
257 4,446,443
264 4,446,444
269 4,446,445

CLASS 331

3 4,446,446
42 4,446,447

CLASS 333

1.1 4,446,448

CLASS 335

131 4,446,449
151 Re.31,579

CLASS 337

380 4,446,450
4,446,451

CLASS 339

12 R 4,445,732
14 R 4,445,733
16 C 4,445,734
17 CF 4,445,736
17 M 4,445,735
18 C 4,445,737
37 4,445,738
42 4,445,739
45 M 4,445,740
49 R 4,445,741
61 M 4,445,742
90 R 4,445,743
94 M 4,445,744
4,445,748
177 R 4,445,745
252 R 4,445,746
256 R 4,445,747

CLASS 340

146.2 4,446,452
286 M 4,446,453
538 4,446,454
568 4,446,455
706 4,446,456
745 4,446,457
825.06 4,446,458
825.07 4,446,462
825.21 4,446,459
825.69 4,446,460
870.32 4,446,461

CLASS 343

371 4,446,463
399 4,446,464
797 4,446,465
877 4,446,466

CLASS 346

76 PH 4,446,467
82 4,446,468
140 R 4,446,469
4,446,470
153.1 4,446,471
4,446,472

CLASS 350

96.12 4,445,759
96.14 4,445,751
96.20 4,445,752
96.21 4,445,750
4,445,753
96.34 4,445,754
4,445,755
376 4,445,749
429 4,445,756
4,445,757

530 4,445,758

CLASS 351

95 4,445,760

CLASS 354

79 4,445,766
121 Re.31,573
195.1 4,445,767
275 4,445,768
303 4,445,770
322 4,445,769
402 4,445,761
417 4,445,763
437 4,445,762
478 4,445,765
480 4,445,764

CLASS 355

3 CH 4,445,772
3 DD 4,445,771
68 4,445,773
71 4,445,774
78 4,445,776
122 4,445,775

CLASS 356

139 4,445,777
222 4,445,778
350 4,445,779
4,445,780

CLASS 357

23 Re.31,580
24 4,446,473
25 4,446,474
40 4,446,475
67 4,446,476
74 4,446,477
75 4,446,478

CLASS 358

4,446,479
104 4,446,480
106 4,446,481
150 4,446,482
154 4,446,483
166 4,446,484
213 4,446,485
280 4,446,486
4,446,487
342 4,446,488

CLASS 360

13 4,446,489
32 4,446,490
48 4,446,491
4,446,492
65 4,446,493
73 4,446,494
74.1 4,446,495
4,446,496
109 4,446,497

CLASS 361

87 4,446,498
92 4,446,499
103 4,446,500
114 4,446,501
308 4,446,502
346 4,446,503
386 4,446,504
413 4,446,505

CLASS 362

17 4,446,506
20 4,446,507
31 4,446,508
184 4,446,509
267 4,446,510
4,446,511

CLASS 363

39 4,446,512
132 4,446,513

CLASS 364

200 4,446,514
4,446,515
4,446,516
4,446,517
4,446,518
300 4,446,519
400 4,446,520
414 4,446,521
426 4,446,522
431.05 4,446,523
463 4,446,524
474 4,446,525
525 4,446,526
558 4,446,527
709 4,446,528
723 4,446,529
725 4,446,530
728 4,446,531
824 4,446,532

900 4,446,533

CLASS 365

96 4,446,534
149 4,446,535
230 4,446,536

CLASS 366

154 4,445,781
217 4,445,782

CLASS 367

15 4,446,537
19 4,446,538
25 4,446,539
26 4,446,540
75 4,446,541
131 4,446,542
149 4,446,543
155 4,446,544

CLASS 368

10 4,445,786
105 4,445,783
157 4,445,784
187 4,445,785

CLASS 369

44 4,446,545
45 4,446,546
74 4,446,547
109 4,446,548
275 4,446,549

CLASS 370

14 4,446,550
16 4,446,551
58 4,446,552
62 4,446,553
4,446,554
94 4,446,555

CLASS 372

4 4,446,556
45 4,446,557
64 4,446,558
95 4,446,559

CLASS 373

4,446,560
25 4,446,561
93 4,446,562
149 4,446,563
157

CLASS 374

45 4,445,790
141 4,445,787
142 4,445,788
198 4,445,789

CLASS 375

8 4,446,564
32 4,446,565
96 4,446,566

CLASS 376

145 4,446,096
256 4,446,097
261 4,446,098
277 4,446,099

CLASS 377

79 4,446,567

CLASS 378

3 4,446,568
115 4,446,569
149 4,446,570

CLASS 384

96 4,445,791
103 4,445,792
130 4,445,793
428 4,445,794

CLASS 400

63 4,445,795
120 4,445,796
166 4,445,797
320 4,445,798

CLASS 402

4 4,445,799

CLASS 403

14 4,445,800
219 4,445,801

CLASS 404

10 4,445,803
40 4,445,802

CLASS 405

173 4,445,804
203 4,445,805
216 4,445,806
227 4,445,807

259 4,445,808

CLASS 406

152 4,445,809

CLASS 407

118 4,445,810

CLASS 409

182 4,445,811

CLASS 411

57 4,445,812

CLASS 413

1 4,445,813

CLASS 414

295 4,445,814

CLASS 415

12 4,445,815
181 4,445,816

CLASS 416

227 4,445,817

CLASS 417

288 4,445,818
318 4,445,819
366 4,445,820
4,445,821
388 4,445,822
430 4,445,823
440 4,445,824
462 4,445,825
476 4,445,826
477 4,445,827
490 4,445,828
543 4,445,829

CLASS 418

22 4,445,830
201 4,445,831

CLASS 419

48 4,446,100

CLASS 420

424 4,446,101
507 4,446,102

CLASS 422

37 4,446,103
63 4,446,104
70 4,446,105
72 4,446,106
107 4,446,107
156 4,446,108
168 4,446,109
186.05 4,446,110
200 4,446,111
216 4,446,112
267 4,446,113

CLASS 423

10 4,446,114
63 4,446,115
4,446,116
121 4,446,117
226 4,446,118
228 4,446,119
350 4,446,120
644 4,446,121

CLASS 424

1.1 4,446,122
4,446,123
27 4,446,124
49 4,446,125
59 4,446,127
88 4,446,128
94 4,446,129
101 4,446,134
141 Re.31,576
154 4,446,135
177 4,446,136
183 4,446,126
195 4,446,130
4,446,131
233 4,446,132
246 4,446,137
248.57 4,446,138
250 4,446,133
256 4,446,139
260 4,446,140
267 4,446,141
269 4,446,142
270 4,446,143
4,446,144
4,446,150
273 R 4,446,145
4,446,148
4,446,149
274 4,446,146
4,446,147
319 4,446,151
322 4,446,152
343 4,446,153
350 4,446,154
4,446,155

CLASS 425

9 4,445,832
36 4,445,834
131.1 4,445,835
131.5 4,445,833
135 4,445,836
141 Re.31,574
4,445,837
319 4,445,838
421 4,445,839
450.1 4,445,840

CLASS 426

3 4,446,157
79 4,446,158
249 4,446,159
297 4,446,160
335 4,446,161
424 4,446,162
448 4,446,163
583 4,446,164
602 4,446,165
631 4,446,166
650 4,446,167

CLASS 427

39 4,446,168
53.1 4,446,169
130 4,446,170
160 4,446,171
4,446,172
206 4,446,173
261 4,446,174
385.5 4,446,175
386 4,446,176

CLASS 428

13 4,446,177
26 4,446,178
31 4,446,179
35 4,446,180
36 4,446,181
40 4,446,182
42 4,446,183
57 4,446,184
67 4,446,185
74 4,446,186
136 4,446,187
138 4,446,188
152 4,446,189
156 4,446,190
245 4,446,191
254 4,446,202
283 4,446,203
323 4,446,204
327 4,446,205
339 4,446,192
364 4,446,206
402 4,446,207
407 4,446,208
411 4,446,209
422 4,446,193
428 4,446,194
458 4,446,195
544 4,446,196
625 4,446,197
4,446,198
639 4,446,199
648 4,446,156
661 4,446,200
696 4,446,201

CLASS 429

42 4,446,210
101 4,446,211
103 4,446,212
104 4,446,213
179 4,446,214
190 4,446,215

CLASS 430

58 4,446,217
175 4,446,218
216 4,446,219
286 4,446,220
302 4,446,221
307 4,446,222
338 4,446,223
346 4,446,224
393 4,446,225
405 4,446,216
506 4,446,226
513 4,446,227
567 4,446,228

CLASS 431

27 4,445,841
115 4,445,842
4,445,843
170 4,445,844
295 4,445,845

352 4,445,846
362 4,445,847

CLASS 432

13 4,445,848
128 4,445,849
229 4,445,850
239 4,445,851
260 4,445,852

CLASS 433

5 4,445,853
37 4,445,854
59 4,445,855
71 4,445,856
75 4,445,857
79 4,445,859
132 4,445,860
141 4,445,858
181 4,445,861
191 4,445,862
212 4,445,863

CLASS 434

76 4,445,870
88 4,445,868
114 4,445,871
156 4,445,869
173 4,445,864
207 4,445,865
253 4,445,866
404 4,445,867

CLASS 435

1 4,446,229
6 4,446,230
7 4,446,231
4,446,232
4,446,233
29 4,446,234
91 4,446,235
287 4,446,236

CLASS 436

504 4,446,237
527 4,446,238
532 4,446,239
542 4,446,240

CLASS 445

3 4,445,872
6 4,445,873
45 4,445,874

CLASS 464

14 4,445,875
48 4,445,876

CLASS 474

92 4,445,878
205 4,445,879
255 4,445,877

CLASS 493

28 4,445,880
376 4,445,882
424 4,445,881

CLASS 494

21 4,445,883

CLASS 501

14 4,446,241
96 4,446,242

CLASS 502

62 4,446,243
84 4,446,244
101 4,446,245
155 4,446,246
167 4,446,247
211 4,446,248
225 4,446,249
309 4,446,250
355 4,446,057

CLASS 518

716 4,446,251

CLASS 521

28 4,446,252
79 4,446,253
92 4,446,254

CLASS 523

205 4,446,255
402 4,446,256
403 4,446,257
406 4,446,258
408 4,446,259
409 4,446,260
514 Re.31,577

CLASS 524

40 4,446,261
89 4,446,262
100 4,446,263

109 4,446,264
139 4,446,265
193 4,446,266
211 4,446,267
315 4,446,268
316 4,446,269
433 4,446,270
441 4,446,271
465 4,446,272
556 4,446,273
812 4,446,274

CLASS 525

54.1 4,446,275
64 4,446,276
68 4,446,277
92 4,446,278
106 4,446,279
186 4,446,280
282 4,446,281
327.7 4,446,282
344 4,446,283
383 4,446,284
439 4,446,285
455 4,446,286

CLASS 526

81 4,446,287
129 4,446,288
142 4,446,289
174 4,446,290
209 4,446,291

CLASS 528

29 4,446,292
45 4,446,293
128 4,446,294
168 4,446,295
198 4,446,296
204 4,446,297
4,446,298
272 4,446,299
288 4,446,300
295.3 4,446,301
302 4,446,302
308.2 4,446,303
335 4,446,304
348 4,446,305
366 4,446,306
406 4,446,307
481 4,446,308
486 4,446,309
487 4,446,310
493 4,446,311

CLASS 536

1.1 4,446,312
18.6 4,446,313
21 4,446,314
27 4,446,315
112 4,446,316

CLASS 544

22 4,446,317
26 4,446,318
92 4,446,319
106 4,446,320
124 4,446,321
138 4,446,322
344 4,446,323

CLASS 546

37 4,446,324
283 4,446,325

CLASS 548

240 Re.31,578
438 4,446,326

CLASS 549

307 4,446,327

CLASS 568

479 4,446,328

CLASS 585

458 4,446,329

CLASS 604

4 4,445,884
28 4,445,885
4,445,886
4,445,887
4,445,888
49 4,445,889
101 4,445,892
103 4,445,890
4,445,891
165 4,445,893
179 4,445,894
193 4,445,895
238 4,445,896
280 4,445,897
337 4,445,898
385 4,445,899
389 4,445,900

CLASSIFICATION OF DESIGNS

D2—	275	273,624		31	273,640	D8—	8	273,656		191	273,672	D21—	52	273,688		26	273,704
	279	273,625		47	273,641		82	273,657		338	273,673	D22—	13	273,689			273,705
		273,626		48	273,642		396	273,658	D13—	24	273,674		23	273,690		35	273,706
	282	273,627		84	273,643			273,659		27	273,675			273,691			273,707
		273,628		96	273,644	D9—	337	273,660	D14—	1	273,676		24	273,692		36	273,708
		273,629		117	273,645		374	273,661		65	273,677	D23—	2	273,693		59	273,709
	309	273,630		181	273,646		435	273,662		73	273,678		3	273,694	D25—	58	273,710
	310	273,631		188	273,647		447	273,663		106	273,679			273,695		73	273,711
		273,632		192	273,648	D10—	73	273,664	D15—	21	273,680			273,696		77	273,712
	334	273,633			273,649		91	273,665		133	273,681			273,697	D27—	3	273,714
	449	273,634		252	273,650	D11—	1	273,666		139	273,682		19	273,698			273,715
D4—	25	273,635	D7—	6	273,651		155	273,667	D16—	1	273,683			273,699		03	273,713
	38	273,636		17	273,652	D12—	92	273,668		102	273,684		56	273,700	D28—	7	273,716
D6—	25	273,637		47	273,653		156	273,669		131	273,685		67	273,701	D29—	06	273,717
	27	273,638		307	273,654			273,670	D20—	6	273,686		163	273,702	D30—	99	273,718
	30	273,639		351	273,655		181	273,671		32	273,687	D24—	1.1	273,703			

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